

CPHE-CLIC

SOCHARA

Community Health

Library and Information Centre (CLIC)

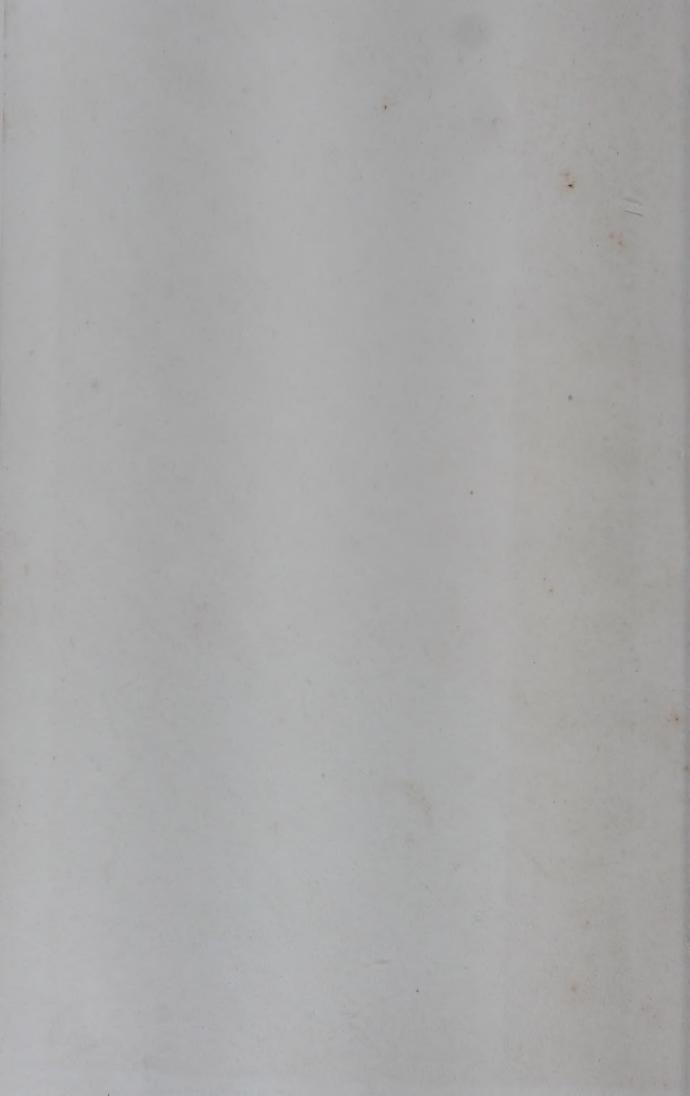
Centre for Public Health and Equity No. 27, 1st Floor, 6th Cross, 1st Main, 1st Block, Koramangala, Bengaluru - 34

Tel: 080 - 41280009

email: clic@sochara.org / cphe@sochara.org

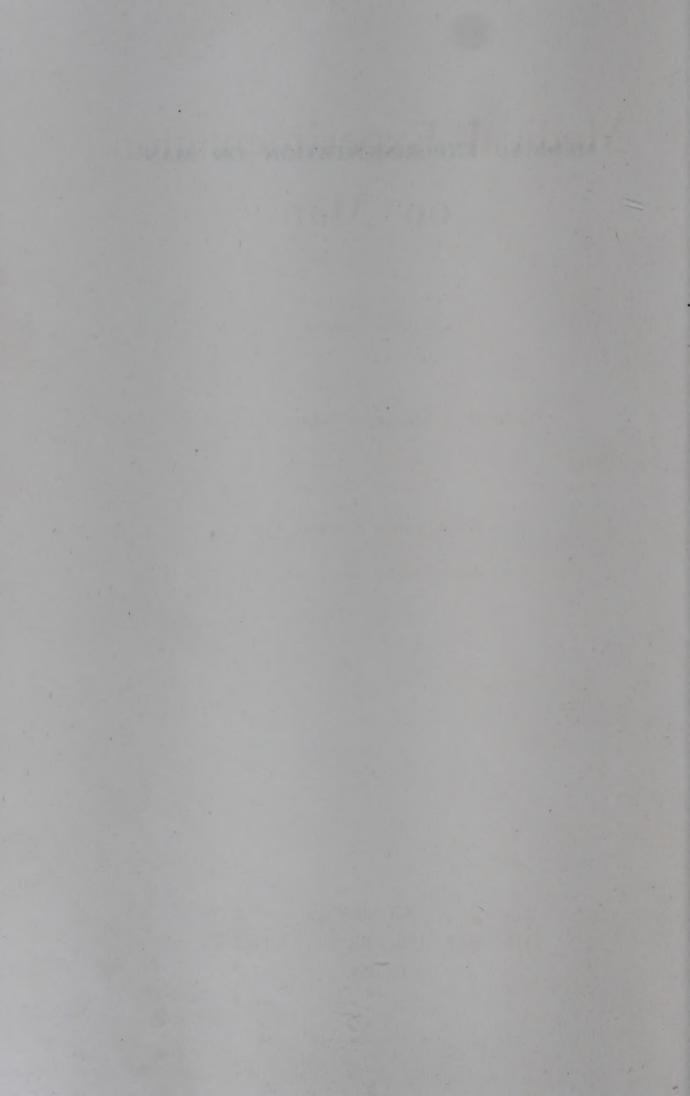
www.sochara.org







MEDICAL EXPERIMENTATION ON MAN



Medical Experimentation on Man

A Cahier Laënnec

Translated by MALACHY GERARD CARROLL

Edited, with a Foreword, by

Dom Peter Flood, O.S.B., B.A., M.D., M.CH., J.C.L.

MCMLV
THE MERCIER PRESS, LIMITED,
CORK

First published in English in Summer, 1955, by The Mercier Press, Limited, 19 Maylor Street, Cork, Ireland.

Nihil Obstat: Hubertus Richards, S.T.L., L.S.S., Censor Deputatus.

Imprimatur: T. Morrogh Bernard, Vic. Gen. Westmonasterii, die 31. Martii 1955.

Printed in the Republic of Ireland by The Kerryman, Limited, Tralee.

12167

CONTENTS

Fo	REWORD BY THE EDITOR	5
Pri	EFACE TO THE FRENCH EDITION	II
	Part One. The Historical Background	
Hu	JMAN EXPERIMENTATION THROUGH THE AGES	
	By Albert-Buisson	r 3
	Part Two. Modern Aspects of Experimentation	
I.	THE DOCTOR AND HUMAN EXPERIMENTATION	
	By Dr. Pierre Tanret	24
II.	SURGERY AND HUMAN EXPERIMENTATION	
	By Dr. Charles Dubost	38
III.	HUMAN EXPERIMENTATION IN INFECTIOUS PATHOLOGY	
50 and an	By Dr. André Jude	49
IV.	Unprincipled and Irresponsible Experimentation	
	By Dr. Henri Peguignot	66
	Part Three. Law and Morality	
I.	Administrative Texts and Human Experimentation	
	By Charles Vaille	74
II.	CIVIL AND PENAL RESPONSIBILITY IN EXPERIMENTATION ON	
	Man-By JM. Auby	90
III.	MORAL REFLECTION—By Père E. Tesson, S.J	IOI
	Part Four. Documents	
I.	Experimentation in Nazi Germany from 1940 to 1945	
	By Gonzague Pierre	116
II.	GERMAN CRITICISMS OF THE ACCUSATIONS AGAINST GERMAN	
	Doctors	141



FOREWORD BY THE EDITOR

The papers collected in the first half of this volume relate to questions that must be answered, as one of them so clearly shows, not merely by medical research workers but by every practitioner in medicine. As medical science rapidly advances, pari passu with the advance in allied departments of science, new means of investigating and treating disease become available and the application of new procedures and remedies to the individual case while they are still largely untried, and perhaps insufficiently understood, necessarily raise the question as to the lawfulness of their use. Fortunately the ethical principles are clear; and it may be helpful to summarise them at this stage in order that readers may possess criteria by which to assess the discussions here reported.

The alleged interest whether of the individual patient or of the community cannot render lawful procedures that are morally wrong in themselves. It was the negation of this principle that led to the dreadful abuse of medical experimentation which took place in Germany under the Hitler régime and which has so shocked the conscience of the medical world. It is well to remember also that procedures that involve the performance of acts evil in themselves, such as masturbation, the recall to the conscious level of experiences that constitute a new occasion of sin for the individual, as also so-called therapeutic abortion and the killing of the aged and incurable so often practised, even in some of our own hospitals, are equally wrong.

The commercial distribution of new remedies is not permissible before their action has been carefully evaluated in the laboratory by such animal experiments as may be necessary to assess their effect on a living organism and to determine the dosage it is safe to employ. Nor is it to be permitted that the distribution of dangerous remedies should reach untrained or inadequately trained practitioners or that advertising brochures should conceal, or minimise, the danger of the remedy presented or its possible toxic side effects. When all this has been done, there remains a duty for the practitioner, before he employs a new or dangerous remedy, to make himself acquainted with the

technique of its application, dosage, and the procedures to be adopted should untoward results occur. Nor may he employ it unless with a chance of success where other tried remedies have been exhibited unsuccessfully, or where, for a good reason, their use is contraindicated,

or they are not available.

This chance of success has to be judged having regard to the reasonably anticipated prognosis of the case if the new remedy is not administered. But once the practitioner has decided that the circumstances of the case justify the use of the remedy he proposes to employ, he has still to obtain the consent to its use from the patient, or his legal representative, if he be a minor or otherwise incapable of using his own mind. This requirement imposes upon the doctor the duty of making clear to the patient the extent of the danger and the probable prognosis of his illness with and without the use of the drug or procedure recommended. If, as often happens, the patient leaves the decision to the judgment of the doctor himself, the doctor should come to that decision which he would wish to be taken if the case were a close relative of his own, having full regard to the ethical requirements of the actual case before him; for neither he nor the State, nor any representative of the patient can give a permission that the patient must refuse on ethical grounds. Here we may call to mind that the State exists through, and for, man as he is in his personal being. There is no human organisation that does not exist, if it has an ethical right to exist, for the usefulness of man. Even the State exists for man and not man for the State.

But what of those cases where the first experiments must be found in the first application of a remedy to a human being? The solution of such cases does not prescind from established principles. The risk must be proportionate to the gravity of the case and the more complete failure of tried remedies and there must be a reasonable prospect of success. The patient must consent and must know to what he consents to such a degree that he would not refuse if he knew more. In regard to all these problems there are not wanting some who wrongly assert that the restrictions imposed by the ethical rule prevent scientific advance, but there can be no true human progress that is not consonant with man's ultimate destiny in the Mind of God. Pope Pius XII has stated the position clearly:

The limits We have outlined are not by definition an obstacle to progresss. The field of medicine cannot be different in this respect from other fields of man's research, investigations and work. The great moral demands force the impetuous flow of human thought and will to flow, like water from the mountains, into certain channels. They contain the flow, to increase its efficiency and usefulness. They dam it so that it does not overflow and cause ravages that can never be compensated for by the special good it seeks. In appearance, moral demands are a brake. In fact, they contribute to the best and the most beautiful of what man has produced for science, the individual and the community.¹

^{1.} Allocution of Pius XII: First International Congress on Histopathology of the Nervous System, 1952. Trans. National Catholic Welfare Conference, Washington, D.C.



PREFACE TO THE FRENCH EDITION

THE MENTION of the word 'experimentation,' when the context is medicine and not the veterinary art or research on animals, immediately awakens the listener's distrust. For, in our day, does not this term come too often with 'a whiff of the concentration camp'?

And yet, the moment a book on the history of medicine is opened, one is faced with a succession of therapeutic attempts which are

indeed experiments on man.

Were not these experiments practised by researchers who had few scruples and who would have transgressed the limits fixed by traditional morality? By no means. And for the past century, the considerable advances in medical science incite the doctor more than ever to seek out new therapeutic methods which would put him in a better position to heal his patients. Thus it is that, without always being explicitly conscious of it, the doctor becomes more and more an experimenter. He would hesitate, however, to go forward in this way, along which public opinion would push him. For public opinion, with its customary illogicality, both kicks against the idea of experimentation, and at the same time is impatient and annoyed to find that there are still so many therapeutic failures. Thus one sees associations of patients clamorously demanding the right to experiment on their members with procedures regarded as dangerous or useless by specialists!

It seems worthwhile, therefore, to lay down the conditions for valid experimentation, with regard to both science and conscience.

Today, perhaps more than formerly, the man of science turns questioningly towards the moralist. But the answer he usually receives disappoints him, because it shows too often a certain lack of knowledge. In the 1951 Social Week, for instance, an alleged satisfactory answer was given to this problem, in the form of a distinction made between 'a therapeutic treatment, entailing even serious risks aimed at curing the patient'—which is, therefore, 'not experimentation'—and the prohibited experimentation which would consist 'essentially in verifying an hypothesis.'

This distinction, indeed, is simply a verbal one, remote from the

practical problem. It will furnish little light to the doctor of good will; and the unscrupulous doctor will find in it a pretext for repulsing all intrusion of the moralist into his domain—the moralist whom he declares to be incompetent to deal with such problems.

Is it not, therefore, to the doctor who is both a man of science and a man of conscience that we must turn, first and foremost? He alone can explain to the layman how medicine progresses; he alone can reassure the layman to some extent, by describing the hesitations and the anguish with which the experimenter pays for each of his thera-

peutic attempts.

We must also appeal to the evidence. All therapeutic progress is the result of experimentation in the strict sense of the word; but we do not mean that the primary purpose is not the curing of the patient, but rather that this very curing is obtained only by a treatment which is directed by an a priori idea, that is, by an hypothesis. A discontinuity already occurs in passing from the animal to man, and it must be accepted; the result, in spite of all previous verifications, remains hypothetical. To deny this essential aspect would be to give proof of bad faith. Moreover, is not experimentation a daily fact with the politician, the official, and the mere individual—all 'unconscious and irresponsible experimenters'?

It is clear, therefore, that there must be human experimentation in Medicine. But for all that, we do not wish this book to be regarded simply as an apologia for experimentation. Society has also the duty of

organising and controlling these interventions on man.

Moreover, the medical conscience must also be alive to the excesses always possible in this matter-excesses that the Nazi pseudoexperimentations have made so glaringly notorious. It will thus be seen how vast a difference there is between legitimate therapeutic experimentation and experimentation inspired by mere curiosity or

by pure sadism.

The reading of the following articles will enable the moralist to gain a proper knowledge of the exact conditions for the development of a science that aims at man's good. He will be brought into closer contact with these realities, and thereby enabled to fix in a more realistic way the frontiers between the licit and the illicit. For his part, the doctor, enlightened and strengthened, will be able to consider and to decide conscientiously the concrete problems of his daily practice.

PART ONE

The Historical Background

Human Experimentation Through the Ages

One of the difficulties of the medical art is this: whatever the cause of diseases may be, what is the principle and the source of the evils which affect the body? If, in fact, one knew the cause of disease, one would be in a position to apply suitable remedies to the body, because one would know with certainty what things are contrary to the evils.

Thus spoke Hippocrates. After twenty-four centuries of research, Medicine can but take up the problem at one remove, and reshape the question as: The cause of the evil being known, how is the appropriate remedy to be discovered? And our contemporaries, more learned than the Greek doctors, are reduced to using the same method of relying on experiment. From earliest times to our own day, Medicine has been able to progress only by tentative steps and by successive experiments on living matter, most often on the human body. To trace the history of experimentation on man would, therefore, be equivalent to studying the whole evolution of medical science throughout the centuries. I need hardly warn my reader that this short account can be considered only as an introduction to a study which should perhaps some day be fully carried out, and which would constitute an important chapter in the History of Medicine.

But the history of experimentation on man may also be the history of a moral problem. However exhaustive the precautions with which the modern doctor or surgeon surrounds himself, and however lengthy the roll of successes to which he can point, he is never absolutely certain that he will cure his patient. Every medical intervention, every operation on the human body, is a violation; how can one ever be sure that it will not be injurious? However rigorously exact his method may be, the medical specialist is not unaware of the dangers to which he is exposed. The human organism is a cosmos that is very complex, and whoever wishes to know it

must constantly revise his judgments. The most brilliant of specialists are also the most wary in watching for the unpredictable reaction of an organism on which 'artifice' has been used. One can imagine the anguish of a Pasteur at the moment of injecting a man with a rabid virus.

Though the consent of the patient cannot diminish the doctor's responsibility, this proof of confidence is nevertheless the finest tribute that can be paid to him. Is it not also an effective help: The Greeks were not unaware of it, as Plato's portrait of the doctor, in the Laws, clearly shows:

The doctor . . . makes a profound examination of diseases in their origin and according to their development. In chatting with the patient and with his friends, he himself gains a personal knowledge of the patient, and he also instructs the patient as much as possible. He imposes no prescription without having first, in some way, induced the patient to share his view of the matter; and it is then only, while he keeps the patient docile through persuasion, that, leading him towards health, he endeavours to accomplish his task.

The Greeks respected man. The experiments in which Nazi doctors allowed themselves to indulge during the last war may lead us to fear that this respect has been lost. But such relapses into barbarism are not, unfortunately, without parallel in history; and yet, medicine certainly takes its place among the sciences whose enrichment has contributed most to the moral progress of humanity. After the dangerous uncertainties of a still very imperfect art, an experimental technique, as prudent as it was meticulous, and which was applied to man only when buttressed by the surest guarantees, gradually came into existence. To trace the evolution of experimentation on man is to sound the praises of a medical conscience ever more and more scrupulous.

Medicine was practised from most remote times, and the first therapeutic attempts could only have been experimental actions on man. A hundred human skulls from the neolithic age have been found, bearing the marks of artificially made apertures; in thirty-two cases, clear fractures had preceded trepanation; nineteen of these men had survived the operation. One cannot but greatly admire those surgeons of ancient times, when one compares their rudimentary equipment with the perfected and delicate instruments used by modern neuro-

surgery.

Medical practice is as old as man; but the Greeks were the first

to use observation and experiment in a reasoned and systematic way. 'Diseases can be conquered to the extent to which the constitution of the patients offers matter for observation,' says Hippocrates. This implied that Greek medicine acted only with circumspection, and that experimentation of new therapeutic methods was resorted to only when preliminary analysis had been completed. Experimentation on animals existed among the Greeks. Hippocrates pointed out the beneficent effect of potions on the respiratory canals. He claimed that this was demonstrated by the fact that an infinitesimal drop of liquid passes through the larynx, and he supported his thesis by appealing to an experiment:

Here is the proof of this fact. Tinge some water with blue or with minium, and give it to a very thirsty animal to drink; a pig will suit the purpose, since it is a beast which is neither delicate nor particular. Then cut its throat while it is drinking, and you will find it coloured by the liquid. However, this operation will not succeed in the hands of the first comer. We must not be disbelieved, on the subject of liquid, when we say that it

does good to the canal in man.

This experiment has certainly not all desirable scientific rigour, and it would not have satisfied Claude Bernard. Nevertheless, it reveals a real spirit of constructive research. Natural observation alone appears henceforward insufficient, and the need is felt to establish by experimentation in what conditions it is possible to act on animals, with a

view to discovering the effect of a remedy on man.

The Greeks would not admit that such practices could be indulged where a human being was concerned, even if the person were a slave. We know that the Romans could be less scrupulous, but they were not guided by a true scientific spirit, and the art of Hippocrates was scarcely excelled in the course of several centuries. Experimentation on man seemed incompatible with Christian morality. The profound ignorance of anatomy, so prejudicial to the Medicine of the Middle Ages, is shown by the horror occasioned by the mere idea of dismembering a human corpse. Even in the eighteenth century, the practice of dissection was not free from difficulties; but curiosity was strongest in doctors of the early Italian Renaissance.

This curiosity took the form of a real epidemic of experimentation on the human body. The procedure was not regarded as being less reprehensible than formerly, but scientists pretended to appease their conscience by operating on those condemned to death, without giving a thought to the fact that they were thereby ruining their dignity as

men of science by usurping the functions of the hangman. These experiments had been aimed principally at the study of toxic products. Thus, Fallope, the great Pisan anatomist, had two condemned persons given to him by the Grand Duke of Tuscany in order to test out on them the effects of opium; one died, and the other was cured and received his pardon from the Duke, though in the event it proved a fruitless pardon, since Fallope decided to repeat the experiment on him, with the result that he died. This was not an isolated case; the same procedures were used in Bologna, in Ferrara, in Mantua. Pope Clement VIII himself had experiments carried out on some Corsicans with a secret oil which was to serve as an antidote to aconite; and only one of the subjects survived. The famous French surgeon, Ambroise Paré, also indulged in experiments of this kind, at the instance of Charles IX, when an attempt was made to establish the antitoxic action of secretions contained in the intestines of cows, and called 'bezoards.' Ambroise Paré gave a sublimate, and then some bezoards, to a man condemned to death. The suffering was so cruel that the patient declared when dying that he would have infinitely preferred the gallows.

The slight knowledge acquired could not compensate for the cruelty of such experiments. Surgery had at least the excuse of necessity; it is indebted to Ambroise Paré for considerable advances. But we must not forget that success was attained only by gradual stages, and that it was man who had to pay the price for a primitive or insufficiently evolved surgery. The practice of blood transfusion, for example, is an operative act whose harmlessness was gained only at the price of patient hematological studies. The first attempts at transfusion from animal to animal were made in 1657 by Richard Lower; and on June 15, 1667, Danys operated for the first time on a man by injecting 250 gr. of the arterial blood of a lamb into the veins of a boy of sixteen! Repeated with such blood donors, these transfusions were infallibly fatal. The practice was therefore forbidden.

transfusions were infallibly fatal. The practice was therefore forbidden. The first remedies with chemical products for basis were also tried out on man, and often caused serious accidents. In the gamut of ancient remedies which gave birth to efficacious modern chemiotherapy, antimony may be taken as typifying the experimental part of all therapeutics. Basil Valentin, Benedictine monk and famous alchemist of the sixteenth century, discovered a new metal. To prove its power, he administered it first to some pigs, with marvellous

success; they visibly fattened. Encouraged by this initial success, he administered the remedy to the monks of his community, and as a result they became violently sick. He concluded that this new metal, so excellent for pigs, was no good for the monks; and, since he had to find a name for it, he simply called it antimoine—'anti-monk' (antimony)—instead of having recourse to some learned syllables from Greek or Latin. Valentin equally experimented when he administered a medicament to the monks which he regarded as a panacea. The purity or impurity of the metal (often arsenic), and the variation of the doses used, were the origins of results sometimes favourable, sometimes disastrous, which fed for many years the famous antimony dispute.

If doctors of the eighteenth century were more circumspect and if they restrained themselves to more minute observations, they remained none the less faithful to a very empirical method where experimentation on the human body was still indispensable. The discovery of vaccine

by Jenner is characteristic of this period.

As a prevention against smallpox, a procedure emanating from the East was then in vogue; the subject was inoculated with a mild form of the disease, by means of smallpox scabs. Now, Jenner noticed that persons who had previously contracted the 'pocks' through contact with cows affected with cowpox, remained immune from variolisation. He linked up this exact observation with the popular belief that such people were immune from smallpox epidemics, and he began a long series of experiments. He removed a little of the serum from the lesion of cowpox in a farmhand, and inoculated an eight-year-old child. Some days later a characteristic eruption appeared, comparable in every way with that which comes spontaneously from contact with an infected cow. Three months later, Jenner inoculated the youngster with a particularly severe smallpox virus, and the boy remained immune. Jenner completed his observations by showing that the lesion obtained in the human body could be serially inoculated; in other words, that the virus cultivated in the human body is transmissible to other persons without losing any of its vigour.

Jenner proceeded, therefore, in a manner more empirical than scientific, since he confined himself to applying serially a preventive against smallpox which had been revealed to him by his observation of some facts, and which he considered to be harmless. He was led to his conclusion simply by that intuition that engenders the experi-

mental idea, and to which we owe so many discoveries. In other circumstances, the same method has yielded disastrous results.

The first experiments on syphilis, in the mid-nineteenth century, were carried out on man before they could be supported by all desirable scientific rigour. Inoculations were performed with products from venereal diseases, without their nature being exactly known: those products were gonococcal pus or the secretion from a soft chancre. Ricord, who retained some scruples, inoculated the chancerous matter only to determined specifics; now, he certainly inoculated syphilitic lesions at the same time as soft chancre, because he made no distinction between the two. It was not until 1905 that the rabbit replaced man, and proved the better living reactive for the experimental study of syphilis. We have here an example of the regrettable consequences that can follow such undue haste.

The foundation of the scientific experimental method was laid down by Claude Bernard. In the celebrated *Introduction* he has defined the essential principles and established the basis for experimentation such as it is still practised today. Henceforward, therapeutic exper-

imentation is carried out as a rule only on the animal.

The work of Pasteur and of his disciples was the finest illustration of this method. But all the guarantees obtained through prolonged experimentation on animals could not dispel the anguish the scientist experiences when he must try out some medication, for the first time, on a human being. Pasteur gives us this moving testimony:

I had reached a total of fifty dogs, of all ages and breeds, proved to be absolutely immune, when, on July 6th, 1885, three persons from Alsace arrived unexpectedly at my laboratory. One of the three was Joseph Meister, aged nine years, who had been cruelly bitten by a mad dog on July 4th. . . . The death of this child seemed inevitable. On the advice of Professors Vulpian and Grancher, I decided, not without keen and cruel uneasiness, to try out on Meister the method which I had constantly found successful with the dogs.

The application of B.C.G. by Calmette and Guérin is a typical example of modern experimentation. When seeking a means to dispose of complete bacillary suspensions, the two scientists were led to use the bile. The culture on a potato treated with the glycerinated bile of an ox, proved difficult and took on a special form. On repeating these experiments, Calmette and Guérin were surprised to notice the diminution, and then the disappearance of its pathogenic power, first with the bovidae, then with the monkeys, and finally with

the guinea pigs and rabbits. Having obtained regular immunity with the laboratory animals, they went on to its application in veterinary practice. Vaccination with B.C.G., minutely established in the laboratory and widely applied to animals, may be henceforth envisaged

as a possible preventive against human tuberculosis.

Unfortunately, in the case of a great number of diseases, experimentation on the animal is useless. 'This is perhaps,' writes René Leriche, 'because the reproduction of a disease in an animal demands, in fact, previous knowledge of the conditions of its appearance in man, which knowledge often remains half obscured for us in a widely comprehensive hypothesis.' However that may be, experimentation on man becomes again indispensable, as was especially the case with yellow fever.

After very many experiments, the Cuban doctor, Carlos Finlay, had discovered, in 1884, that a mosquito was the propagating agent of the disease. But his thesis had to wait twenty years for proof, when a commission of American scientists carried out the following experiments. Twelve persons were isolated for two weeks in a camp where they were subjected for experimental purposes to mosquito bites, the mosquitos having been fed with the blood of yellow fever patients. After two or three days, ten of the twelve fell ill in their turn. This was regarded as a perfect proof.

Among the volunteers who figured in this experiment was an American doctor. Such an attitude is a credit to Medicine and this is not an isolated case. Many doctors have preferred to use their own bodies for experimentation rather than accept those who offer themselves so unselfishly but without appreciating the dangers to which they were exposing themselves. Danielsen, Lagoudaky, Arning did not hesitate to inoculate themselves with leprosy. Thurburn Mason voluntarily contracted malaria by exposing himself to the bites of infected mosquitos.

This heroism commands our admiration; it has done splendid service to science and has made possible the saving of many human lives. Nevertheless, we can hold that the scientist must refuse to do so, until the last moment, either when it concerns experimentation on his own person or on that of another.

Charles Nicolle, when faced with various problems raised by exanthematic typhus, did not and would not have recourse to man. By making use of the monkey and thus avoiding the dangers of

experimentation on man, he was able to give a completely successful proof of his discovery, and thereby establish the part played by the

louse in propagating this disease.

In spite of the prudence and the sacrifices of doctors faithful to their mission, human experimentation has served as a pretext for one of the most barbarous enterprises of our times, when Nazi Germany discovered that such experimentation could become a new, more refined form of torture. One could then protest, as formerly Montaigne did:

I could hardly have believed, until I saw it with my own eyes, that there could have been found souls so unnatural that they could commit murder for the mere pleasure they took in it; that they could hack and mangle others' limbs, that they could sharpen their wits to invent unheard-of tortures and new kinds of death, without enmity, without profit, and to the sole end of enjoying the pleasing spectacle of the pitiful gestures and motions, the lamentable cries and groans, of a man dying in agony. (Of Cruelty. Trans. Trenchmann. O.U.P. New York and London, I, 424).

The Nuremberg trials have brought to light in all their details, the 'experiments' carried out in Germany from 1942 to 1944: inoculations with infectious diseases; investigations on the resistance of the human organism to cold, to prolonged immersion, to low pressure; experiments on the effects of poisons, toxic gases, phosphorus burns; experiments on the excision and transplantation of spinal marrow; sterilisations; castrations, etc.

The majority of these experiments entailed unspeakable sufferings and claimed an incredible number of victims. Some of them appear so fantastic that they seem to have been inspired more by insanity than by the spirit of cruelty. When we consider the small profit that accrued to science from the heaped-up sufferings endured by thousands of human beings, we can have no hesitation in declaring that these experiments were not only useless, but degrading for those who performed them. Lecomte de Noüy has the following comment to make on these horrible actions:

Germany has destroyed the effort of centuries. She has dragged mankind backwards, and has gloried in this return to the darkest ages which mankind had succeeded in almost forgetting. She has scientifically reawakened in man the instincts of the beast, but of a beast a thousand times worse than any savage animal, an unhealthy, intelligent beast, hypocritical and brutal, which regards its brain simply as an instrument for increasing a hundredfold the atavistic ferocity of which man was beginning to lose even the memory.

. . . Germany has not understood that civilization has no reason of being,

unless it promotes the perfection of the human person and not the perfection of the instruments used by man.

The German experiment has brutally revealed all the dangers involved in the application of the method of human experimentation, but it does not affect the principle of such experimentation. There can be no research, no discoveries, no progress, without experimentation. The increasing ambitions of man command him to explore, to the utmost possible limits, the faculties for adaptation and for resistance possessed by his organic and psychic being. One symptom of this is the demand for a systematic exploitation of the elements and of planetary forces. The increase of travel-speed entails experimentation on the resistance of man's cardio-vascular system to centrifugal forces. Everything which the genius of physics has discovered for our comfort has been the object of research on man. One cannot help imagining the tests which man must impose on himself if he is to realize his dream of interplanetary travel. At all events, one fact is certain: experimentation on man remains a necessity, but its dangers can be limited.

To establish the effect of a new therapeutic treatment, test products or placebos are now usually employed. These consist of something which appears to be absolutely identical with the product being tested, but which does not contain the active substance. This makes possible the discovery of cases where a psychic reaction of the subject would falsify the result of an experimentation. But the best guarantee remains the conscience and the scruples of the doctor.

Our ignorance of the future advances of science, and our fear of the uses to which man will put those advances, make it more than ever imperative for us to put all our confidence in the doctor, the protector of souls. The rash experiments of former times were perhaps excusable; but recent history has shown us how easily such experiments can be diverted from their true purpose, and how a bold experiment aimed at solacing millions of human beings can be made the pretext for tortures and exterminations whose sole purpose is to strengthen a nation's power for war.

'The real danger,' writes Charles Nicolle, 'is that, once entered on the path of human experimentation, we do not know where to stop. I am not referring to Pasteur's experiment on hydrophobia.' And how is the 'human material' to be chosen? Is this 'material' to be drawn from races which some regard as inferior because they have

developed a form of civilization different from ours? Has slavery been abolished, only to rise again in a more abject manner? The use of those condemned to death seems, at first sight, less odious: the majority of experiments would not have serious consequences, and the subject would thus have a chance of survival which would normally be refused to him. But in any case, the doctor should not usurp the function of the hangman, even to become a benevolent hangman. The criminal may become simply a patient on whom the chastisement of the law falls because the remedy for his induced disease is not known. Experimentation on the infirm and the insane is even less admissible. But cannot such experimentation be practised on volunteers? This tolerance masks a certain confusion. The volunteer is most often only a layman: a serious accident is always possible, and perhaps he will then regret his decision. Doctors have subjected themselves many times to experimental tests, some of which entailed real danger; and undoubtedly this is the most chivalrous aspect of the scientific vocation. But if these heroes of science pay with their lives for the discovery they leave as legacy to the world, do they not commit an error? The first World War sacrificed a whole élite, and this spiritual amputation is not unconnected with the moral confusion of today. Glory is not the strength and vitality of a country. It is important that certain values should not be sacrificed.

But there are also men of every race and of every country whose lives must be protected, who must be preserved from any experimentation on their flesh and any violation of their soul. Today, medicine takes on very heavy responsibilities. At the World Congress of Doctors, which was held shortly after the Nuremberg Trials, Charles Richet proposed that the Hippocratic oath should be completed, and that the doctor should swear to respect the person and the moral liberty of every patient, friend or enemy, of whatever race or religion. That same Congress expressed the wish that an international medical

code of laws should be drawn up as quickly as possible.

Would such a code be more effective than the Geneva Convention? We must hope so, because we are no longer concerned with conceiving an aesthetic morality, as were the Greek philosophers. It is no longer sufficient to built up a rationalist morality. The only ideas vigorous enough to safeguard the respect due to the dignity of man are those of the Gospel. For the Gospel will give all its force to the philosophical maxim: 'Act in such a manner that you treat humanity, both in

your own person and in the person of another, as an end, and never as a means.'

Albert-Buisson Secrétaire pérpétuel de l'Académie des Sciences Morales et Politiques.

PART TWO

Modern Aspects of Experimentation

I.

The Doctor and Human Experimentation

EXPERIMENTAL MEDICINE is a branch of Medicine, as is proved by the fact that Claude Bernard has written an *Introduction* to it which is always worth rereading; by the fact that our medical schools have created chairs of experimental medicine, and have prescribed examination in the subject. The layman may thus be led to think that the State gives him a guarantee that his doctor possesses the qualities of a medical experimenter; and is it indeed for this very reason that the layman so often protests that he is, as he puts it, the 'guinea pig' of his doctors?

This attitude is both false and true. It is false because experimental Medicine is Medicine only in name, its subject being the animal. The introduction to real experimental Medicine, that is to the discipline exercised on man, does not as yet seem to have been written. Moreover, this Medicine is learned only in the hospital. But the layman's attitude is true to this extent—that even the most simple medical act, as we shall attempt to show, entails theoretically and practically some experimentation on man. But there is even a stronger case, since experimentation is the foundation of all medical knowledge and of all medical progress, just as it is the foundation of knowledge and progress in any science. Such experimentation consists of many stages, but the last and the most important stage is experimentation on man.

Medicine was for a long time what Voltaire reproaches it with being: 'The art of treating by means of those bodies of which one knows next to nothing, bodies about which one knows even less.' Scarcely one hundred and fifty years have gone by since medicine got out of that rut. To do so, it was necessary to make that immense

extra-metaphysical, extra-sentimental effort of objectivity which men had previously been unable to make. It was necessary that men should see steadily the reality of their nature, both in health and in sickness, with the same calm detachment with which they viewed other things in the world.

Man is but a reed, the most feeble thing in Nature, but he is a thinking reed. The entire universe need not arm itself to rush him. A vapour, a drop of water suffices to kill him. But, if the universe were to crush him, man would still be more noble than that which killed him, because he knows that he dies. . . . All our dignity consists then in thought. . . . Let us endeavour then to think well. (Pascal, *Penseés*; Trans. W. F. Trotter. Dutton & Co.).

Of course, the co-operation of mind and of act, of brain and of hand, is necessary, were it only in order to attempt to find means of prolonging life as much as possible; and moreover, there is the question of knowing what is the physiological man, and what is the 'drop of water,' what the 'vapour,' which kills him. It is this hand, apparently ignored by Pascal, which prolongs the mind and incarnates it in experimentation; it is by the hand that man is present to the Universe, and the Universe present to him.

At first, of course, we have but an ignorant mind and an unpractised hand, but such is our nature. We must accept the risks entailed, and we shall examine them. We can thus make the anguish and the responsibilities of our medical profession better appreciated by those who understand us so little, and who sometimes judge us.

MEDICAL DIAGNOSIS INVOLVES EXPERIMENTATION ON MAN

To reach a diagnosis, it is first necessary to define the object, in the most general scientific fashion, by means of an investigation that is as exhaustive as possible. The second step is to link that object with others like it, in a collection of symptoms designated by a name. To make a diagnosis is to pass from the concrete to the abstract. It is to transform, for example, Mr. X. who has a stitch in his side, a touch of fever, or inflammation of the base of the lung, into 'a case of pneumonia.' Henceforward, the doctor will be dealing with a case of pneumonia, and not with Mr. X.; and behind that case of pneumonia is the textbook section on pneumonia, with all its expert paragraphs and all the deductions that can be drawn from them. This can be of great benefit to cases of pneumonia in general, and to Mr. X. in

particular. Science is the general factor; the particular factor is the medical art, which would be mere quackery if it were not supported by that science. Now, the definition of the object is the result of a methodical investigation of a fragment of the universe. And Claude Bernard has defined experiment as 'conducted investigation.'

It makes little difference whether this investigation is made directly, by the aid of our senses, or indirectly, by the aid of instruments; in both cases, every one of our actions is inspired by a question. Nature provides the answer to that question, and the objective symptoms are the fruit of experiment.

We are no longer in an epoch when, as in the time of Hippocrates, 'judgments' are made only 'by the eyes, the ears, the nose, the hand;

by looking, touching, listening, smelling and tasting.'

Our methods of investigation use far more advanced techniques, such as X-ray, endoscopies, deductions of all kinds, and the results of chemical and histological examinations and of experiments on animals.

But from the hand that feels to the hand that manipulates the most complicated instruments, there is an insensible transition, a progressive complication of the same gesture—the experimental gesture of a systematic investigation of the patient. To refuse to employ these techniques would be to abdicate all reason, and, since one is not a thaumaturgist, to lose in consequence all means of action.

Thus we have acquired the notion of symptoms: static and direct manifestations—spontaneous, they may be called, but experimentally

sought-of a lesion.

Yet more developed in the order of experimentation is the search for 'signs.' Monier-Vinard, the great neurologist, has differentiated clearly, in the order of values, between the symptom, such as we have just defined it, and the sign. The latter is always the result of a dynamic experiment, of a functional experiment, by which the results in a normal condition are compared with those in a pathological condition. (Masson, Neurologie).

Were we to induce a tendinous reflex, and find that it was ample, lively, polykinetic, and diffused, this would enable us to recognize a sign, a fundamental difference from the normal—the 'exaggeration' of reflex actions. Were we to scrape the sole of the foot and find that, contrary to the normal reaction, the big toe was raised, this would again be an experiment; it would reveal to us a difference of reflex

behaviour between the sick subject and the healthy subject. Such experiments led Monier-Vinard to conclude, in connection with signs, that 'when well and truly established, their existence is a reliable indication of the organic perturbation of the function to which each of them is related.' We underline the word 'organic' in this quotation.

The past one hundred and fifty years have seen the development of anatomo-clinical methodology, thanks to which, through Morgagni, through Laënnec, and the great clinicians of the nineteenth century, Medicine has at last emerged from the Hippocratic mists. For those who, for example in neurology, have lived through the great epoch of Charcot and that which immediately followed, the sole concern was certainly to connect symptoms and signs with a particular lesion.

Just as, after an attack, the dead are counted on the battlefield, so at that epoch the essential of diagnosis was to enumerate the lesions and localise them. It is thus that, behind those medical words 'symptoms' and 'signs', there was first of all a matter of anatomy. Indeed, disease carries out, according to the happy expression of Claude Bernard, a spontaneous experiment, an experiment on man which produces, better than the most skilled experimenter could do, mutilations sometimes very selective in the midst of organs most difficult of access. By the dysfunctions it occasions, it demonstrates relations between the injured organs and their functions. Is it not indeed by the discovery of anatomo-clinical relations of this order that progress has often been made in physiology and in experimental Medicine: Apart from the numerous and clear examples from neurology, we may instance the discovery by Addison of the 'Disease of the Suprarenal Capsules,' as he described it in 1855. This discovery led to the investigations of Brown-Séquard and of Langlois into the experimental problem of surrenalectomy and its consequences. Or again, the discoveries of Fodere, followed by those of Gull and of Ord, and finally by those of the surgeon Reverdin, have first suggested the role of the thyroid in goitrous cretinism, and then in myxoedema, and have orientated the experimental studies of Von Eiselberg, Vassale, and Gley on thyroidectomy and its results on the animal. Thus it comes about that our classical Medicine is founded on the lesion, on its diagnosis and on its functional consequences. In classical Medicine, the results of anatomo-clinical methods and of experimental Medicine are summarily united.

We use the word 'summarily' here, because the 'meladonermy' of

Addison's Disease, for example, cannot be experimentally reproduced. There is a difference, often an important difference, between the experimental disease and the human disease, because it is not possible to connect certain most indisputable signs accepted by modern Medicine with a dysfunction of such-and-such an organ, and still less with such-and-such a lesion of that organ. From a lesional point of view, what would be the significance of an enlargement of the triangle of hyperglycemia? An anomaly in the test of induced diuresis? A reduction in anal metabolism?

It is often by the juxtaposing of many experiments that disease is now studied, and it is well known to what extent the functions of an organ can be dissociated one from the other in presence of disease. The interrelations between groups of organs sometimes partly affect the problem and the understanding of morbid troubles, that is to say, of physiopathological processes, and thus necessitate increasingly intensive investigations on the patient afflicted with those troubles. To some extent, one now tends to turn from the cirrhotic to Mr. X. afflicted with cirrhosis of the liver. It is with Mr. X. that we are dealing; or, more exactly, with a special complexus, with Mr. X. afflicted with what is generally called cirrhosis. It is for the organism of Mr. X. to respond, in its own original fashion, to such-and-such a functional experiment. Experimental, original knowledge of Mr. X. must be gained; for the problem in question arises in connection with Mr. X. alone, and not with such-and-such an animal.

Happy the Mr. X. who will find doctors sufficiently learned and sufficiently patient to bring to light the sources of his misery. But what do Mr. X. and his family think of it? And what, moreover, is the psychology of his doctor? This is another aspect of the problem.

THE PSYCHOLOGICAL ASPECTS

If Mr. X. is well-to-do and if he regards himself as enlightened, he will almost surely protest. He will find it difficult to endure the repetition of experiments and blood tests; he will maintain that all this is not necessary, and that he is being used. If the diagnosis is not certain, the puncture-biopsy of the liver, for example, will cause a great fuss. And if, on quite another occasion, he were required to undergo, and to undergo several times, such-and-such a painful endoscopy, would he not rather prefer to change his doctor?

If Mr. X. is poor—at least in spirit; if his sole capital is his health, or if he accepts the common lot of mortals, which is to be sick before death, he will allow himself to be examined as much as is necessary. He has confidence in his doctor, who will not seek previous written authorisation from him, and he will put himself in his hands. Happy the doctor who knows how to arouse that confidence and inspire that total abandonment in his patients! With regard to what is specifically medical, the personal element will be reduced to the minimum. Thus, the patient, physiologically known as much as appears useful, will stand a better chance of being healed.

It is then that the doctor, on his part, can take on great responsibilities, because certain examinations involve a risk for the patient. These examinations are indispensable in relation to Medicine, that is in relation to the *ensemble* of anterior knowledge and of experimental processes necessary to comply with Medicine; but this *responsibility towards the métier* becomes the *conscience*, pure and simple, with all that the moral tradition attaches to this term.

We emphasize as an important point that sins of omission are much more frequent than sins by commission among medical faults. It can be maintained without paradox that in Medicine it is difficult enough to kill a man. Apart from mischance or culpable ignorance, to kill a man is to manifest an experimental imagination which is not within the mental scope of all. Conversely, how easy it is, how much less troublesome, to allow a patient to die from lack of sufficient examination, and by avoiding difficulties, complications and fuss. It could thus be maintained that the medical act is a homicide à rebours—a passive homicide—which requires a lot of premeditation. That patient is indeed unfortunate who raises unreasonable difficulties to examination and observation.

And will Mr. X. complain if the knowledge gained from the observation of his case does not benefit him directly, but will one day benefit others? Has he not himself benefited from the sum total of experiments carried out on other patients before him? The scientific exploitation of the misfortune of one for the benefit of others is sometimes censured under the name of 'biological morality.' It must be noticed that in every case these misfortunes are not provoked by others but are imposed by nature; that we are all equal, all anonymous, when we stand before nature; that everything that concerns the physiological nature of a man is the concern of all humanity. Man

and humanity are not inseparable; what affects a man affects humanity, and vice versa. Thus, experimentation on a man possesses a power of generalisation which augments its efficacy and which enlarges the scope of its necessities and of its rights.

We shall now see how all this applies to therapeutics.

EXPERIMENTATION AS AN INTEGRAL PART OF THERAPEUTICS

When a diagnosis has been reached, a number of precise therapeutic sanctions generally result from it, which are the fruit of all previous experimentation on animals and on man. When therapeutics was much poorer than it is today, there was much less hesitation. In the 'questions' of fifteen years ago, the chapter headed 'treatment' was often among the most summary. At the present time, therapeutic progress is such that it has often completely changed the classic evolution of diseases, and has substituted a very different description for the accepted one. Moreover, much of this therapeutic progress is recent, even very recent, because science moves swiftly in our times. This results in special difficulties arising as regards the therapy to be used and the particular mode of its application. Recourse must be had to experimentation on the patient.

There are difficulties of choice. Sometimes the problem does not arise, either because we are not equipped, or because a single therapeutic principle exists—for example, the essential principle of serotherapy in diphtheria; or again, because one of the modes of treatment proposed is recognized as indisputably superior to the others. But this is far

from being always the case.

The picture is rather one of urgency and the need for choice. The patient's disease has not yet been completely identified and studied; and in face of such-and-such a septicemic condition whose pathological germ will not be for some days recognized for what it is, nor its reactions to various antibiotics established, a choice must be made among these antibiotics, short of using them all at once, which would be a very costly business. Those which, according to medical literature, are the most probably efficacious in the circumstances will be chosen from among the possible therapeutic methods; and, of course, the personal experience of each doctor will contribute to the choice.

But very often the result cannot be certainly guaranteed in advance, even if every precaution seems to have been taken. Medicine proposes;

but experience disposes.

When failure results from the application of one therapeutic principle, it must be abandoned for another, and this second for a third if it too proves unsuccessful. Thus, by trying the various methods a suitable solution may be reached.

There are difficulties in the methods of application. It is not sufficient simply to have a remedy; there remains the problem of applying it to each particular case, the problem of posology, of the mode of administration. A certain remedy would be efficacious if it were given in sufficient doses; but it would be dangerous if, in the case of this particular patient, the generally recognized and sanctioned doses were administered, because they would be too strong, in view of the special conditions pertaining. For example, what great prudence must be exercised in the case of a patient suffering from secondary syphilitic nephritis, when treating him with penicillin, mercury, or arsenic. With what tentativeness should not the individual régime, the dose, the mode of administration, be fixed, when there is question of treating a diabetic with insulin. There again, experimentation is as necessary as it is to an infantryman who learns to hit his targets eventually by a process of aiming too high and again too low. And these difficulties can be still greater when we are dealing with a recently discovered medicament whose posology may not yet be perfectly fixed.

But we are now touching on a burning question: experimentation

on man with a new therapeutic process.

There are various reasons that lead to its being attempted. They may be extra-medical. A laboratory has succeeded in the synthesis of a new body whose chemical constitution, belonging to the same family as a substance known to be active, gives rise to the hope that it may be similar or superior in its activity. Experimental research has established in what doses this drug is toxic, by milligrams to the kilo of bodily weight, with different kinds of animals; by what dose the desired effect was obtained with these animals, and what were the other secondary effects on each of the major functions. It remains to discover whether it will be active with the patient, and what will be its posology.

The result is uncertain. Toxicity with men and with animals can be very different for the same chemical body, and the pharmacological effects can be very distinct. As to the effects on human disease, they are very conjectural, because the results obtained from experimental disease are often subject to caution. This animal disease, indeed,

by reason of the field in which it has evolved and by reason of the means by which it has been provoked, can present only more or less strict analogies with the spontaneous disease of man. Certitudes cannot be based on analogies.

Experimentation must be carried over to an almost new ground, therefore, in passing to the case of the sick man. The cases to which it

will now be applied will be previously very well defined.

Prudence, progressiveness, attentive observation—such are the watchwords of this experimentation. But, as with all experimentation, its results must be compared with those of similar new experiments. Such comparisons will result in the preparation of statistics, which, if they are to be of any value, should deal with cases as similar as possible. The results, interpreted according to statistical methods, will then be compared with those which have been obtained, in the same clinical circumstances, either by treating the patients by another, classic method, or by allowing the disease to run its natural course. All this may seem commonplace, but it raises great difficulties in practice.

There are technical difficulties into which we shall not enter here, when there is question of operating on a considerable number of comparable cases, of interpreting and noting the results, of getting to the root of numerous observations, with ill-disciplined patients,

and so on.

But there are other considerations that will hinder experimentation—considerations of a moral order. For example, when an efficacious treatment for the disease already exists, the trial of a new procedure will deprive the patient of the classic treatment. If the new experimentation proves unsuccessful, there is danger of prejudice to the health of the patient, and this prejudice may be serious.

Conversely, if the new medication proves active, the comparison of its experimental results with those of a known therapy, or with those of the *natura curatrix*, may seriously involve moral responsibility. Can I thus leave one group without treatment and another group with treatment which I consider as of little effect—that is to say, two control groups; while a third group only shall have the right to benefit from the progress of science? If the results with the first and second groups are less favourable than with the third, shall I not have to reproach myself with the certain deaths that could have been avoided, and certain sufferings that need not have been borne?

But if the extraordinary unfortunately happens; if the new process, in spite of all my prudence and my care, occasions serious accidents,

to what regrets shall I not be a prey?

What further complicates the problem is that there is a character of irreversibility which distinguishes experimentation on men from experimentation on animals. The death of a number of animals is without consequences: the experiment can be repeated while varying the conditions that obtain. The decision to use a certain therapy, as a result of which a patient dies, raises for the doctor the almost insoluble question of whether that decision was opportune and right. 'If I had not done that; if I had chosen this other. . . .' The same case will never be repeated, in the same set of circumstances. Even on the physiological plane, every man has something personal and irreplaceable which prevents his case from being ever perfectly identifiable with those of the same group. Where an observation on a human being is concerned, there can be no going back nor any recommencing.

These responsibilities are, however, perhaps less acute than they seem, if an indefinite margin of time is regarded as a characteristic of experimentation on man. For time is the great experimenter in Medicine. It is time that confirms or dethrones medical procedures; it is through time that useful comparisons are drawn up between results gathered at random in diverse clinical circumstances. The medical house is most often built by a number of doctors pooling their results; each supplies his stone for the edifice. The doctor who would undertake to build alone a final house aere perennius, would prove a man of rash and untimely haste. These delays are burdensome only to the competition of pharmaceutical firms, and to the petty vanity of authors. The whole truth never emerges from efforts of publicity.

At all times the doctor is led to experiment with a new product, or a new application of an established procedure, in very urgent circumstances. He is dealing with a case that he regards, in all conscience, as desperate. In these circumstances, an association of ideas leads him to envisage a hazardous solution which may even seem dangerous, the rational basis of which may seem uncertain. There is, however, something of the homo faber, something of practical intelligence, in many doctors, thanks to which, as Claude Bernard puts it so well, 'we are able to do more than we know.' How can

the doctor be reproached with attempting the last experiment in such circumstances? Admirable results have been due to just such final experiments. When Pasteur, for example, undertook to inoculate young Joseph Meister with an antirabid vaccine, was he not taking a certain number of chances, when the matter is considered rationally? Perhaps the subject was not in a condition for rabid incubation; again, there was danger of inoculating him with hydrophobia. We know what terrible anguish this experimentation caused Pasteur. He is not the only one who has known such to-and-fro tuggings of conscience. An experiment is a gamble, where we risk our all on one throw, because we hope that the dice is loaded in our favour.

THE RESPONSIBILITY OF DOCTORS IN THERAPEUTIC EXPERIMENTATION

We have just seen that to treat a patient always involves some experimentation. We can foresee the result of our efforts only with a degree of probability—a high degree most often, but sometimes with

considerably less.

To a certain extent, therefore, it is at the risk of the patients that we exercise the art of medicine. But a long and indisputable experience of man shows that these risks are less, and now considerably less, than those which arise from abandoning the patient to his lot. This minimising of risks is, therefore, the reason medicine exists in society. To accept medicine is to accept its experimental character, and the imperfections implied in that character.

How are we to limit these risks with which we are so readily reproached? 'Not,' it is said, 'by not experimenting; since you maintain that this would mean an end to therapeutics. But confine yourselves to the use of well-established therapeutic methods.' This is, in effect, a verdict given in the Cour de Paris. I cite the report which M. Alphonse Richard has presented recently to the Académie

de Médecine:

According to a verdict of May 20, 1936, on the report of Conseiller Générale Jasserand and the conclusions of Procureur Général Paul Matter, the Court has decided that a real contract is formed between the patient and his client. This contract comprises for the doctor an undertaking, not of course to heal the patient, but to treat him; his treatment will not be of any kind whatever, but will be conscientiously chosen, and, apart from exceptional circumstances, in conformity with the accepted data of science.

'Where would the mind be tested, if not in a verdict?' asks a character in Anatole France. If that is so in the verdict quoted, all is perhaps not as it should be.

Apart from exceptionally fortunate circumstances, therefore, which doubtless permit the use on man of the data we have envisaged above, we are simply to continue what our predecessors have done. The house of medicine and therapeutics is completed, and we must simply remove the scaffolding. Everything that has not been written in the past must be regarded as suspect; and, in order to avoid incurring penalties, the 'conscientious' doctor who has a respect for the law should avoid like the plague the use of those recent medicaments still in the late experimental stage, and a fortiori, the use of every new therapeutic method. In a word, he must respect the Ancients; and it seems that, to push this attitude to its extreme, we should feel a nostalgia for the time when Docteurs Bahis and Macroton, of Molière's Médecin malgré lui, spoke only on Hippocrates and Galen.

Medicine is but tardily forgiven for having spoilt the joke against itself.

* * *

In the last analysis, what the world thinks of us is merely of relative importance. We owe no duty to opinion, except to clarify it.

Medical morality, which has borrowed so much from Christianity, can be almost summarised in these two principles: Thou shalt not kill; and as an extension of this: Thou shalt not injure. Thou shalt endeavour to prolong life as much as thou canst.

These are the two imperatives; the second is the more specifically medical and is a corollary of the first. In the concrete reality of everyday life, these two imperatives may be brought into conflict, in spite of the doctor's undoubted integrity, because, in attempting to prolong life, the doctor may sometimes cut it short. But this is simply the margin of risk involved in all therapeutics.

There is of course the temptation, to which the Nazis succumbed on a huge scale, to acquire by means of experimentation on a given man, knowledge that will be eventually useful to the life of others. This is done without there being particular physiopathological reasons in the case of this man, by which such experimentation on him can be justified. But, on the human plane, the particular takes precedence of the general; an individual man comes before society and medicine.

To behave in any other manner would be to betray the traditional contract binding us personally, as doctors, to each person to whom we minister. This pre-eminence of the concrete case over the abstract case absolutely distinguishes this experimentation on man from every other kind of scientific methodology.

Though our professional morality thus assigns limits to the right of experimentation on man, those limits are still very generous ones. Up to a certain point, these limits can be known only by doctors, so specialised are the conditions of our profession. Doctors alone can bring to the question a motivated appreciation, even to its details. That is why the judge whose duty it is to defend the rights of the human person will choose to be enlightened by the medical experts; for they alone are capable of appreciating the circumstances and the indications, and of deciding what is possible and what is impossible.

We recognize the judge's right to protect the individual against abusive or criminal experimentation; but it must be remembered that it is not in the courts, apart from exceptional circumstances, that the real discussion takes place. It occurs in many sick rooms, in the wards of clinics and hospitals; and that every day. There is no court there, nor any judges in ermine. There are simply the patient, we the doctors, and God.

The patient is the vessel in danger. We, the doctors—'Masters under God'—are professionally in charge. It is a terrible prerogative, but it is, nevertheless, a fact.

Who will demand from us an account of our actions? Men? Only in exceptional cases. Usually, neither the patient nor his entourage nor society can exercise a constant, enlightened, and therefore, efficacious control. Our own moral conscience is our only light. The Judge who will pass the final verdict on our intentions and our actions in such a case, will be Our Lord on the Last Day.

To place such great confidence in us appears exorbitant. And yet it is when the case is most serious, the urgency most pressing, the dossier most incommunicable, that this confidence is most readily given to us. Would what is then accepted be accepted in other circumstances? I do not know; assato il pericolo, gabbato il santo, says the Italian proverb.

But it is true that every medical act raises the preliminary question of confidence, even when it is impossible for us to explain to our clients on what that confidence bears. This is so:

-because in order to understand, one must be a doctor;

-because, even if we were doctors, in the quality of patients, we

would not have the advantage of knowing anything;

—because there is a medical secret, which is as indispensable with regard to the patient, at least in many cases, as it is with regard to society.

This secret should not be a refuge for us, but an increase of responsibility; at the very most we can sometimes share it with fellow doctors. But this secret will bind us all the more firmly with regard to our patients, in proportion as our moral personality has been more completely involved because of experimentation. And since there is here question of a necessity and of a truth, we can simply cite in justification this maxim of the ancient Hippocrates:

Sacred things are only revealed to sacred men, and are concealed from the profane until they have been initiated into the mysteries of science.

We may be pardoned the word 'sacred' here, since it is used in reference to the medical art. It bears a relation to the sacred character of human life of relation

of human life, of which we are the guardians.

And be assured of this: although the medical art has been exercised over a very long period of time, we doctors have not been unworthy of the confidence humanity has placed in us. For the better doctors we are, the better human beings we are too.

DOCTEUR PIERRE TANRET Médecin des Hôpitaux de Paris.

Surgery and Human Experimentation

THE WHOLE HISTORY OF SURGERY, both of resection and of reparation, is dominated by human experimentation, without which it could never have made its astonishing progress, nor reached a stage when it can offer the extraordinary modern possibilities of replacement or of restoration.

Experimentation on animals suffers from a serious initial handicap. The animal used in the experiment is not suffering from the required disease, its organism being a healthy one; and moreover, we have many examples to show that the reactions of the animal organism differ from those of the human organism. The sentimental side of experimentation on animals is sufficient to exclude, in certain countries, the possibilities of such study; but apart from this, it appears that, although this experimentation has made possible the foundation of modern physiology, it lends itself badly to the study of the major surgical data concerning the ablation of a diseased organ. On the other hand, it offers the possibility of studying, in a manner completely comparable with the human organism, the different methods of suture, whether of the intestine or of vessels; in a word, it illustrates well the most simple and elementary surgical procedures.

In this exposé we are not concerned with the immorality and aberration of a certain type of human experimentation, such as that brought to light in the Nuremberg trials. That is a very special aspect of the question with which it is outside our competence to deal. The aspect of the problem with which we are concerned here is not that of the surgeon's responsibility towards his patient, but rather his responsibility towards himself. Within what limits has he the right to act? To what extent has he the right and the duty to use new and unestablished processes, as soon as it is admitted that every surgical act of any

importance involves some experimentation?

RESECTION OF ORGANS

In research concerned with the resection of organs, animal experimentation furnishes a very useful technical and physiological basis, because it shows how the healthy animal reacts to the ablation of the stomach, the lung, or a part of the intestines. Moreover, it even leads to discovery of the technical procedures of such operations, which procedures can be immediately applied, with scarcely any modification, to the sick man.

These preliminary tests, however, must in all cases, have provided a solid foundation for the proposed intervention on man. For instance, the total ablation of the pancreas from a dog results in very serious troubles that show themselves first in the immediate development of diabetes with acidosis; and if this is not immediately treated, death quickly follows.

We can appreciate the hesitations of those surgeons who were the first to practise total excision of the pancreas as a treatment for cancer. Their hesitation was increased by the fact that, for anatomical and physiological reasons, excision of the pancreas in man cannot be performed without an accompanying resection of two-thirds of the stomach, the duodenum, the first part of the jejunum, and the spleen.

Now, the secondary humoral troubles resulting from this intervention are infinitely less important than in the case of the animals: while one would expect a severe acidosis, this acidosis generally remains moderate, and glycaemia proves very amenable to insulin. Although, of course, the equilibration of the subjects of such operations still raises problems, it is none the less problematical because an appropriate diet, a small daily dose of insulin (30 to 40 units), and the administration of pancreatic extract, enable these patients to live, to exercise their activity, and to remain liable only to the possible recurrence of secondary growths from the tumour that first motivated this severe ablation.

The ablation of organs such as the stomach and the lung, cause less initial hesitation: it is sufficient to know how to close the bronchus and to anastomose the aesophagus with the intestine, to secure the success of these types of operation which do not present, physiologically, the same difficulties as does the ablation of the pancreas. In these cases, operation on the animal achieved the technical realization

of the operative act, the details of which could then be used in operations on man.

But another and not less interesting aspect of the surgical problem of cancer belongs solely to the domain of human experimentation. It is a double problem: on one hand, it represents the application of a scientific attitude; on another, it represents the reasonable or unreasonable limits of the surgical act.

At the present time, in view of the frequency of recurrences after normal—one could say, logical—resection of a cancerous organ, some surgeons no longer incline to the ablation of the organ alone, but to that of a whole area. Indeed, until then, the commonly accepted practice in dealing surgically with cancer was to perform an excision of the affected organ and of the adjacent lymphatic areas: thus the ablation of a cancer of the tongue is accompanied by a complete removal of the glands of the neck; and the removal of a cancer of the rectum involves the ablation of the whole adjacent celluloganglionic area.

In these cases, and in spite of the sacrifices imposed on the patient, the idea of the conservation of the function, or more exactly of an approximate function, is linked in the surgeon's mind with the necessity for the extensive ablation of the lesion. Thus, for example, total gastrectomy offered, through the secondary transformation of the small intestine, possibilities which were on the whole very satisfactory; similarly, the resection of the colon or of the rectum spared the patient a completely artificial anus. This concern for the conservation of the function, even in the case of cancer, was attacked by the partisans of immediate extensive ablation, even in the case of small tumours still in their beginnings. Thus, those who support total gastrectomy in principle, even for tumours localised in the pylorus, are becoming more and more numerous.

It is the digestive region that offers the greatest possibilities of extensive ablations of organs and of areas. When dealing with an extensive abdominal tumour that cannot be dealt with by simple excision, two attitudes are conceivable: abstention, pure and simple; or, at the cost of great risk, the decision to carry out an excision of the whole stomach, of the spleen, of the body and tail of the pancreas and sometimes part of the colon. The surgeon who undertakes to perform this very serious operation, when it is the patient's only chance, needs a great deal of courage. He knows the risks his patient

runs when he carries out this excision for the first time. He also knows that the practice in later identical cases will be made easier, and that there will finally emerge a more regulated, more precise, less disastrous technique, as a result of these successive stages of experimentation. Better still, the surgical treatment of these 'inoperable' cancers, to use the paradoxical title of the work of a celebrated American surgeon, emphasizes the fact that our present methods allow us to extend ceaselessly the limits of operability.

It is precisely this aspect of the problem which I would now like

to deal with.

Anaesthesia, transfusions and antibiotics have made possible the successful undertaking of operations that were regarded as inconceivable ten or fifteen years ago. In cases of cancer that has extended to the whole lumbar region, it is possible to perform an ablation of the rectum, of the uterus and vagina, and of the bladder, provided, of course, that the vascular axis is left intact. This operation leads to such infirmity that many patients refuse to undergo it; nevertheless, it is possible to obtain astonishing results by this method. The same is true of extensive ablations of the organs of the upper digestive region, such as the pancreas and stomach. An idea can be got of the ground that has been covered by recalling that Péan made the first known attempt at performing an ablation of a cancer of the pylorus at the end of the last century, when he carried out an excision of a very short gastric segment.

Moreover, it is impossible to forget the controversies occasioned by the first attempts at ablation of cysts of the ovary, by the same surgeon. The centre of those controversies was his book, La kystectomie

est-elle possible à Paris?

All the advance made has been due to the minute observation of cases, the prudent hardihood of the investigators, and the perfecting of techniques of which the human being constituted the basic element. In the domain of surgical cancer, the progress recorded has certainly been due to premature investigation, but also to a succession of new acts whose accomplishment, as applied to man, made possible the codification of more and more certain and efficacious techniques.

CARDIAC SURGERY

If, in the domain of cancer surgery, the surgeon has the right and the duty to try out new techniques whose efficacy might improve an

often gloomy prognosis, the solution of the problem is infinitely more delicate in other surgical studies, where experimentation on animals is insufficient, of itself, to provide the proof of a solid foundation for theoretical ideas whose human application could, in many cases, lead to spectacular transformation. I refer now to cardiac surgery. In this connection, I shall bring forward some demonstrative examples, of which the first will be that of the 'Tetralogy' of Fallot.

Chronologically it is certainly not the first in the fight against congenital or acquired cardiac lesions; steps had previously been taken against constrictive pericarditis, angina pectoris and persistence of the arterial canal (ductus arteriosus). But it merits the first place by reason of the originality of the ideas that marked its inception.

The anatomical condition known as Fallot's 'Tetralogy' was clearly recognised by Fallot, a doctor of Marseilles, at the end of the last century, and his description of it has undergone only minor modification of detail since then; he described the presence of an aortic arch riding over an incompletely closed interventricular septum with right ventricular hypertrophy associated with stenosis or hypoplasia of the pulmonary artery, this combination producing a cyanosis incompatible with long life.

The credit for having thought out the means of correcting troubles connected with this malformation goes to Helen Taussig. Since the direct correction of this malformation could not be envisaged, it was clearly necessary to have recourse to a palliative process capable of bringing blood to the lungs to be oxygenated, and capable at the same time of partly compensating for the aortic fissure. In the opinion of Alfred Blalock, the most simply applicable process seemed to be an anastomosis between a branch of the aorta and the right or left pulmonary artery: in this way the mixed aortic blood would be partly brought back to the lung by a pulmonary artery rectified on the debit side because of the stenosis of its origin. The result should be the oxygenation of a considerable quantity of blood, without any risk to the right ventricle opening into the aorta. The implementing of these ideas raised difficulties of two kinds: on the one hand, the technical realization of the anastomosis; and on the other hand, the verification of the foundations of Helen Taussig's ideas.

The practice of vascular anastomoses was already sufficiently developed to allow its use, without excessive risk, on children affected

with cyanosis; experimentation on animals made it possible to repeat the technique of such anastomoses to the point of faultless execution. On the other hand, nothing was less sure than the human success of the proposed operation, because of the numerous unknown factors at the very outset: would the chronic anoxemia of the patient allow him to endure an anaesthesia and an intervention which, in the best conditions, might be prolonged for hours?

Anatomical knowledge of the disease showed the existence of numerous malformations capable of making the operation difficult, if not impossible: collateral hilar circulation, more or less marked hypoplasia of the pulmonary artery, aorta in position right or left—all these were factors which, in conjunction, might make the operation impossible. Moreover, was it right to use a method by which a new arterial canal would be created, which in other cases one endeavours to suppress? Would not the child present a progressive cardiac failure? Was he not menaced by a possible infection within this new canal?

All these were questions doomed to remain unanswered so long as the operation was not performed on man.

For it to succeed, however, it was necessary to be sure of the technique of the anastomosis itself. The use of animals made possible the realization of this preparatory part of the operation, by offering a pulmonary artery and a subclavian artery very comparable, both as to their situation and their volume, with the vessels of the children affected with cyanosis.

It was in 1944, after a very long experimental period, that the operation was carried out for the first time on a child affected with Fallot's Tetralogy. It was a success; there was a rapid improvement of the child's cyanosis, the number of his red blood cells diminished to normal, the oxygen-saturation of the blood rose, while at the same time a diminution of dyspnea and an increase in physical development showed themselves in the child. The exactitude of Helen Taussig's conceptions was verified on many children then operated upon by Blalock. At the present time, several thousands of children afflicted with cyanosis have undergone this operation: the results obtained are, on the whole, excellent, the mortality rate from this operation being low.

The impulse had been given by Taussig and Blalock: the human experimental stage began. Without going into technical details here,

we note that different surgeons endeavoured to develop the operative possibilities, to minimise the risks, to make the anastomosis in spite of an unusable subclavian, either by making use of the aorta or by using conserved or autogenic graftings. The techniques were thus gradually codified, and the surgeon has at his disposal today a whole gamut of processes which are all derived from the same principle, and which allow the operation to be performed in all cases, except of course, where the pulmonary artery itself cannot be used.

The case of 'blue babies' may in itself be sufficient to show the role played, in the practice of a new intervention, by faith in an idea and by the thoughtful consent of the patient and of his entourage, in the

absence of any probative experiment.

The history of the surgical treatment of Mitral Stenosis is also rewarding to study. For a long time, it was thought that direct attack on the stenosis, through the endocardiac duct, would be the only means of fighting against the pulmonary obstruction. The first attempts at enlarging the mitral valve, carried out through the transauricular or transventricular duct, met with immediate failure; the patient died from mitral insufficiency, due to the damage caused to the valvular apparatus.

The attempts were abandoned for twenty years, until Bailley established the possibility of restoring the functioning of the mitral valves by the section of their surrounding zones, without touching in any way the valves themselves. 'Mitral commissurotomy' came into being, and with it the possibility of operating on patients in a precarious condition, with a minimum of risk, and of curing them. A simple technical modification had been necessary, consisting of replacing the valvulectomy or the disastrous valvuloplasty by a simple section of the surrounding valvular zones; an excellent result was obtained at the price of very few deaths. Since then, this technique underwent a great development, and the cases operated on can now be counted in hundreds.

This intracardiac surgery must, however, be fully satisfactory; and certainly the methods of anaesthesis, and the pre- and post-operative treatments which we now have at our disposal, make this type of surgery infinitely less deadly than it was only ten years ago. Nevertheless, some continue to regard it as a kind of medical acrobatics, which often succeeds but which remains none the less dangerous for that.

It is for this reason that for some years research in this field has concentrated on the discovery of a mechanical system that will allow access to the exsanguinous cardiac cavities. This artificial 'heart-lungs' system is being studied in the U.S.A. (Gibbon), in Holland (Jongbloed), and in France (Thomas). Experimentation on animals is possible, and already some progress has been made. The time for practical human application, however, seems remote, if one can judge by the many and unknown obstacles with which the experimental process still meets. One can imagine the fears and anxiety that will mark the first meets. 1 One can imagine the fears and anxiety that will mark the first human operation. Years of successful work will be necessary. There will be no haste; ideas of honour and prestige must be set aside; and the operation must be attempted on a patient who is not only willing, but enlightened as to its nature and its risks.

GRAFTING OF ORGANS

The problem of the grafting of organs-renal, for example-has aroused considerable interest.

Experimentally, autograftings were nearly always successful; on the other hand, homografts gradually resulted in atrophy of the kidney, in which secondary infections through the ureter and renal pelvis seemed to play the predominant part. Certainly, the technical problems of removal and of replacement were solved: the operation consisted of an arterio-arterial anastomosis and a veno-venous anastomosis, while the ureter, deprived of blood vessels in its distal part, was brought out on to the surface of the body. We were, however, far from knowing everything about the behaviour of the grafted kidney, about the immunological reactions of the recipient, and about the fight against the formation of antirenal anti-bodies.

I was thus led to perform a grafting for the first time on a patient I was thus led to perform a grafting for the first time on a patient—a woman of forty, nephrectomised on the right side and presenting a progressive nephritis of the remaining kidney. She showed increased urea, and the urea concentration was very poor. The kidney I used was removed from a person condemned to death, at the very place of execution. It was immediately washed in a heparized serum, and taken to the hospital in a refrigerated container.

The grafting operation on the right iliac vessels in the iliac cavity presented no difficulties, and the patient stood up perfectly to the

intervention. The ureter, brought out on to the skin, was catheterized by a polythenic tube; and we were able, from the first day, to collect a certain quantity of urine having the characteristics of a glomerular filtrate. Gradually, the quantity of urine secreted increased, and at the same time the urea concentration rose.

Concomitantly, however, the patient's condition grew worse with the increase of renal secretion. In spite of all the precautions taken to secure water, chlorine and azotic equilibrium, and in spite of the administration of ACTH and cortisone, she died three weeks after the operation, even though her grafted kidney was giving 300 grammes of urine with sufficient concentration. An examination of the kidney showed no evidence of infarction, but on the other hand, there were extensive infected lesions throughout the organ. This failure made us fear to undertake further graftings. I was led to carry out two others in two desperate cases; but they too were failures.

The grafting of differentiated organs, such as the kidney, still meets with problems difficult to solve: problems of an immunological kind especially, and also problems of infection, which still demand extensive and patient laboratory research before such graftings can

be used on men with some chance of success.

DIFFICULTIES OF SURGICAL RESEARCH IN FRANCE

If the human aspect of experimental problems must take the first place, the social aspect is also very important. It can easily be appreciated what a benefit the practical realisation of an artificial heart-lungs system would be, or the extension of researches arising from the application of organic graftings. In our modern society, legislation has provided for each surgical disease a certain coefficient corresponding to the importance of the accomplished act. Now, though our present modern organisation attempts to offer certain possibilities of work to researchers, it does not furnish the necessary scope for such an enterprise.

The problems to be solved are both medico-surgical and physiological. Now, work in common comes up against such great difficulties, arising essentially from our working system, that it is almost useless to envisage at the outset a combined effort. In our surgical domain, what we demand is the possibility of carrying out an operation whose physiological basis shall have been established

with sufficient exactitude to make some chance of success possible. On the other hand, the physiologist, experimenting in his laboratory cannot always work with the idea of the future surgical act in mind. A divergence thus results between two orders of research which have the same objective; and therefore, if an experimental solution or a way to such solution is found, its practical application seems still very remote.

In none of the French hospitals have we the necessary material convenience for the pursuit of such experiments.

Of course, individual efforts and the assistance of public organizations result in certain chance solutions being adopted in some cases; and these solutions make possible the continuity of a work carried out under harassing conditions.

The solution to the problem of the artificial heart, which we have dealt with above, may be taken as an example.

It is concerned with creating and perfecting an apparatus capable of supplying air to the venous blood of the right side of the heart, then oxygenating that blood, and sending it finally into the arterial circulation of the recipient. It supposes, therefore, the realisation of a system of inhaling pumps, of an oxygenator and of a system of pressure pumps, in order to effect the distribution of the oxygenated blood at a certain rhythm, and to a certain systolic and diastolic pressure.

At first, difficulties appeared which affected the very quality of the blood used. The processes of inhalation, oxygenation and pressure, in the case of an animal used for experimentation, entailed the risk not only of hemolysis of the red blood cells but also of a coagulating of the blood and imperfect oxygenation.

The solution of these problems has demanded years of work and seems now to be perfected. Hemolysis is reduced to a minimum, oxygenation can be assured satisfactorily; and accidents of coagulation can be met with heparinisation.

The animal stage of experimentation succeeded to the *in vitro* stage. Now, it seems that, in spite of the perfection of the results obtained with regard to the conservation of the qualities of the oxygenated blood, physico-chemical modifications appear which make it impossible to maintain life in the animal used for experimentation.

The experimenters succeed perfectly in emptying the heart and in reinjecting red blood into the aorta at a rhythm and arterial tension that are those of the normal animal; but for all that, troubles of a humoro-glandular and cerebral order make their appearance, and prevent the permanent survival of the animal.

This shows clearly how difficult a problem this is to solve, and how numerous are the humoral and tissue transformations occasioned

by the implementing of this artificial heart-lungs system.

Its application has indeed been glimpsed, but only from afar. It will necessitate much complementary research, and it will also give rise to investigations whose outcome will perhaps explain the biological phenomena that are still obscure. It will be appreciated that these researches, so important for the future of cardio-pulmonary surgery, must be carried to the final solution with perseverance and with faith.

Our conclusion from this article is no other than this: 'We must continue to experiment.' We have simply brought forward some characteristic examples of the surgeon's attitude towards his patients when he wishes to do for them something beyond the limits of routine treatment. It is not for us to propose any external criterion whatsoever by which he would be able to decide: 'This is permissible; this is not permissible.' The only possible golden rule is that, in each case, the doctor must weigh the risks involved for the patient; he must ask himself whether he is qualified to submit the patient to such risks, while not forgetting the risks which may be incurred by his abstention. Such abstention is very tempting to those doctors who seek only approbation, because such abstention will rarely lead them into trouble.

Docteur Charles Dubost Chirurgien des Hôpitaux de Paris.

^{, 1} Since this was written considerable progress has been made.—Editor.

Human Experimentation in Infectious Pathology

THE PROGRESS of human knowledge in biology and in Medicine has always been vigilantly watched by the sociologist and the moralist. The demands of research are sometimes of such a nature that 'they go the length of turning against humanity' (R.Biot), and the conscience of sociologist and moralist is called upon to judge and to choose.

Respect for the human person is a well-established truth, and it appears to run counter to all possible human experimentation. And yet this experimentation is practised in our day. In the course of bygone centuries, doctors already performed many experiments on man, in the domain of infectious pathology, but the results obtained by these researchers were then known only by a limited public. The experiments carried out in the course of the nineteenth century and the early years of the twentieth, were reported upon to learned societies; it was very rarely, however, that there were any which

had a wide repercussion in the public mind.

In his Traité practique de Bactériologie, published in 1897, Mace acknowledges that experimentation on man is 'among the most delicate of subjects.' In dealing with human experimentation, he wrote, one must never cease to exercise the greatest prudence, and never allow oneself to be guided solely by general ideas or even by acquired results. In 1922 a German author, Moll, devoted one of his works to the question. He put the doctors on their guard against experiments of this kind. In 1934, Charles Nicolle laid down the data of this problem in a course of lectures delivered at the Collège de France. But it was the Nuremberg trial of the Nazi doctors which brought this problem to the notice of the public on a large scale through publication of the atrocities of the concentration camps. No solution was reached through the discussions, in the course of which different ethical systems came into conflict. Some of these experiments were simply crimes ill-concealed by a semblance of

Baruk calls them 'criminal medical experimentation' based on a special perversion of the idea of good and evil. The American expert at Nuremberg, Dr. Alexander, created for them the neologism Ktenology, signifying medical extermination. The guilty certainly deserved the penalty of justice.

But these outrages must not make us forget the important role of human experimentation in medicine, and especially in infectious pathology. They must not result in what Professor Fontaine calls 'a whiff of the concentration camp' attaching itself to this term, any more than it is now possible to confuse experimentation on

animals with vivisection.

But where is the line to be drawn between what can be considered as licit, and what is reprehensible and to be condemned?

QUALITIES OF THE EXPERIMENTER

The discovery of any biological law necessitates two operations: observation and experimentation. The first is passive, the second is active. 'The observer listens to nature; the experimenter questions nature and forces it to yield up its secrets.' (Cuvier).

Observation can only furnish documents, and allow for the distinguishing and classification of facts. But, as Charles Nicolle writes:

As long as medicine confined itself to observations, however highly developed and minutely carried out, it produced only a speculative work and, since imagination and feeling played the principal roles, an abstract art. (L'expérimentation en médecine, Paris, 1934).

To study a phenomenon properly, it must be taken in hand, experimented upon so as to discover its causes, and these causes used to reproduce the phenomenon. Experimentation is therefore indispensable to all medical and biological discovery. These two conditions are not the only ones; they presuppose induction and deduction. 'Observation and experiment to amass the materials; induction and deduction to elaborate them: these are the only good intellectual tools.' (Bacon).

The man who devotes himself to research should not be simply, to use Nicolle's expression, a very clear mirror reflecting facts. He must bring into play qualities of judgment without which biology would be lifeless. Faculties of judgment, observation, and experimentation,

would not, however, be sufficient; when one touches on this problem of the legitimacy of experimentation on man, it is necessary to insist on respect for the human person and on the primordial role of moral conscience in the experimentation.

Experimentation is particularly important in infectious pathology. A patient and minute observation may lead to the suspicion of an etiological agent whose presence will always be found in conjunction with the same symptoms; but only by the inoculation of an animal with the means of producing that agent will it be possible, through the reproduction of the symptoms, to reach any conclusion as to its role in provoking the disease. Once this role has been established, the experimenter will attempt to apply his discoveries to prophylaxis and treatment. Here again, experimentation will play a big role. How is it possible to reach any conclusion as to the efficacy of a vaccine or of a biological treatment without having recourse to experimentation? A striking example of this is provided by the history of anthrax.

In 1838, Delaforn, professor at the Ecole de Maisons-Alfort, microscopically discovered the presence of little, motionless, refractive particles in the blood of animals dead from anthrax. He regarded it as a fact of no great scientific importance, a simple peculiarity that was doubtless due to an alteration in the blood of animals dead from this disease. Rayer and Davaine, who made the same observation in 1850, took up the same attitude.

It was Pasteur who drew all the practical consequences from this observation, thanks to experimentation on a rabbit he inoculated with the disease. He cleared up the confusion between the anthrax bacillus and the septic vibrion, showed the important part played by the spore, established the etiological specificity of the microrganism, and showed the preventive value of vaccination, a brilliant demonstration of which was the celebrated experiment of Pouilly-le-Fort.

Experimentation in the pathology of infection is of great importance. Its purpose is to discover the means calculated to protect the healthy and to treat the infected. All prophylaxis, in order to be efficacious, must extend to a great number of subjects. What is important is not the protection of one subject, but that of a whole collectivity.

Among the ills afflicting mankind, the most frequent are infectious

5. §

diseases. Those are very rare indeed who have been able to escape, for example, the contagious diseases of infancy. An efficacious biological therapy, which could not have been established except through experimentation, is destined to be applied to a considerable number of people.

There is nothing comparable in the other branches of Medicine, where in most cases experimentation aims only at discovering a treatment for certain affections which are less universal and much less

common than contagious diseases.

FROM EXPERIMENTATION ON ANIMALS TO EXPERIMENTATION ON MAN

It is no longer necessary to argue the case for experimentation on animals, because such experimentation is an accepted fact and consecrated by long practice. Although the idea of the suffering caused to these animals disturbs certain people, it does not seem possible to put an end to it. It has become a necessity because, 'apart from its practice, there is little hope of the discovery, prevention, and treatment of the diseases which strike us and the beings necessary to our lives.' (Nicolle).

To a certain extent we have at our disposal animals whose irrational existence puts no obstacle in the way of even fatal experimentation. It is certain, however, that the animal feels the same physical sufferings as we do, and therefore, when the experimenter is compelled to use the animal, he must endeavour to minimize the severity of his acts and not cause needless pain. Less cruel than the physiologist, the experimenter in infectious pathology limits his intervention, in most cases, to the introduction of a needle. The animals certainly suffer from the diseases with which we inoculate them. But the doctors' task is to bring solace to mankind, and the use of animals with a view to doing so is therefore legitimate.

To make use of animals in order to protect ourselves against diseases is neither more nor less legitimate than to kill them for food or make them our slaves. We must not excuse ourselves from a necessity which our sentimentality condemns. (Ch. Nicolle).

Veterinary Medicine itself has the privilege of contributing to the progress of knowledge in the art of healing, 'through the useful and

bold experiments which it can undertake and which would be so

many crimes in human Medicine.' (Vicq d'Azyr).

Among the animals, the behaviour of monkeys comes nearest to that of man. They are susceptible to the majority of the types of virus which attack mankind. In 1898 Josias demonstrated the susceptibility of the sapajou to measles, and this was confirmed later by Nicolle and Conseil (1911), and by Anderson and Goldberger (1911) on the Macacus rhesus and the Macacus cynomolgus. They were equally susceptible, among others, to the virus of influenza (Nicolle and Lebailly, 1918), of mumps (Nicolle and Conseil, 1913), (Johnson and Goapasture, 1934), of poliomyelitis (Leiner and Wiesner, 1909), of lymphogranulo-matosis (Hellerstrom and Wassen, 1936).

It was by their means that Charles Nicolle was able to establish the role of the louse in the transmission of typhus, a very important

idea in the prophylaxis of this disease.

If I had not noticed the susceptibility of little monkeys, and observed that, at least for a time, the louse could live on them, the demonstration of the mode of natural transmission of typhus could not have been carried out except by experimentation on man. I avoided that dangerous experimentation. . . . I was able both to avoid a great risk and to make possible the immediate application of the fact discovered. I repeat, it was a great piece of luck.

But not all species of monkeys are susceptible, and, moreover, the disease may take in them a form that cannot be observed. In this connection, a typical example is given by the Dengue virus, whose inoculation to men has alone made possible the demonstration of the monkey's susceptibility to the disease.

In 1927 and 1928, experimenters inoculated different species of

In 1927 and 1928, experimenters inoculated different species of animals with virulent material (blood and serum). This was also injected into men who were chosen from among volunteers and whose reaction would serve to confirm the virulence of the inoculated product. The moment the reaction showed itself in the man, the experimenters, day after day, took blood from the inoculated animals and injected it into other volunteers. It was the reaction of these latter which made it possible to judge the susceptibility of the laboratory animals.

These experiments were not useless, as some would make out; they demonstrated the role animals can play as carriers and propagators of disease. We may add that Dengue in man reveals itself by a

hyperthermia of short duration, accompanied by an exanthema, and

that cure is usually possible.

But it is a general observation that experimental infection produced in the animal does not correspond to human disease. To kill a guinea pig by an intraperitoneal injection of typhus bacilli, does not enable us to study with certainty the pathogenesis of typhoid fever in man. The experimental typhus of certain laboratory animals completely differs from human typhus. And when one experiments with a large group of virus typhus, it is rarely found that an identical symptomatology is discovered in both the animal and the man. Thus, in certain cases the pursuit of research makes necessary experimentation on man.

It would help the conscience of the experimenter, therefore, if a distinction could be made between the various races of mankind, so goes the argument. Those considered inferior could then be regarded as being human merely in appearance, and to experiment on them would be simply to experiment on animals. This 'biological' mode of thought, destructive of human values, has been that of the Nazi racial madness, which gave over to uncontrolled experimenters, elements it regarded as 'racially inferior'—internees of their concentration camps. We must see in this an echo of the 'Nietzchean doctrine which draws the human monster on to criminal inclines beyond Good and Evil.' (Dessoille and Mme. Laffitte). Biologically and zoologically, only one humanity exists, comprising groups that behave more or less differently from the point of view of susceptibility to different diseases.

Experimentation on man is not, however, a recent phenomenon. Its practice goes back far beyond the era of Pasteur. Even before the discovery of pathogenic microbes, many researchers had attempted to reproduce in the healthy man, by means of inoculation with products suspected of contagion (blood, pus, humours), the symptoms they had observed in the sick. In a book published in Germany in 1922, Moll reports a certain number of human experiments performed by doctors. He consulted six hundred works containing more than a thousand cases of this kind, and he puts doctors on their guard against the immorality of this experimentation. Every experimenter, he says, should ask himself whether he would be prepared to submit his own parents and members of his family to his experiments.

I originally intended to include here a recapitulation of the principal researches made on man in the domain of infectious pathology by various authors since the end of the nineteenth century. Although incomplete, the list was nevertheless a long one; it had, however, to be drawn up very quickly. I found it sufficient to consult the works on infectious pathology and on bacteriology designed for the teaching of medical students. But the purpose of such a list might be questioned: is it to be regarded as a professional honours list, or is it a list of those marked down for the professional pillory? Yet these were experiments performed in the interests of the conservation of human life, and published in scientific reviews. If some of them now seem audacious, extravagant, and even questionable, none of them was useless. The oldest of them have enabled us to orientate our present methods of prophylaxis, and we are their debtors for future methods we hope to discover.

Human experimentation is practised every day. Every application to man of a new biological treatment, or a prophylactic vaccine, constitutes an experiment. However meticulous the researches made and the controls exercised in previous experimentation on animals, it becomes necessary, some time or another, to pass on to man. Is it possible to foresee, for example, all the consequences entailed by the injection of a living vaccine, for a subject about to be immunised? Previous experimentation has shown that this attenuated virus provokes only immunity in the animal, without involving even passing disorders. But can one conclude from animal to man? In spite of the accumulated proofs, doubt persists in the mind of the innovator. In this connection, it is sufficient to recall the anguish felt by Pasteur when he inoculated a man for the first time with antirabid vaccine; or by Jenner, in July, 1796, when he verified, by an injection of smallpox given to an eight-year-old child, the resistance he considered he had given to the child by inoculation with the contents of a postule of cow pox.

The application of a new chemical therapy to man is also experimentation. The determination of the toxicity per kilogram in the case of the rabbit, established through laboratory experimentation on a great number of animals, does not put us in a position to decide with certainty the maximum dose in the case of man, under pain of provoking serious accidents of poisoning or of intolerance. Experimental tests of this kind are accepted by public opinion, with only

a few dissident voices. Human beings cannot be forbidden to protect themselves against evils, and 'we doctors should regard abstention as a crime against the species.' (Nicolle).

Human experimentation practised for a therapeutic purpose is thus admitted by the majority of men. But before the scientist can begin the study of a therapeutic or preventive method it is necessary that he should know well the disease he must combat. His knowledge must enable him to reproduce the disease; moreover, as in the case of the vaccination performed by Jenner, he needs witnesses to judge of the efficacy of the method he has created. Where is the line drawn, if at all, between admissible therapeutic experimentation and pure experimentation involving the reproduction of the disease? Both are dangerous, but the first only finds favour with public opinion.

It is always a bold step to pass for the first time from animal to man. 'My hand will tremble,' wrote Pasteur, 'when I pass from the dog to man.' A living virus, however harmless it may have proved in the first tests, may, for some unsuspected reason, recover its lost virulence or even acquire a new virulence. After nearly a hundred tests, of which the first had been carried out on himself, Charles Nicolle vaccinated ten children of from four to ten years, in the Tunis district, using for the purpose a considerable dose of the brain of a guinea pig infected with typhus. The choice of children was dictated by prudence, because typhus is always mild at an early age. Up to then, the subjects vaccinated in this way had developed, without pathological manifestation, immunity sufficient to enable them to resist a trial inoculation two months later. There was no reason why this particular experiment should not follow the course of the preceding ones. But in the days following the inoculation there was a steep fall in temperature accompanied by torrential rain. A short time later, Nicolle visited this same village, and found the inhabitants shivering. After an average incubation period of ten days, six out of ten of the vaccinated children developed typhus. Fortunately, it was a mild form. 'I have not recommenced the experiment,' he wrote. 'It has confirmed what I already knew: that one does not handle a living virus with impunity, whatever precautions one may have taken to ensure the harmlessness of the test.' (Ch. Nicolle, Revue d'Immunologie, 1935).

SELECTION OF SUBJECTS FOR EXPERIMENTATION

It is customary for the experimenter to establish first of all on himself the harmlessness of the biological product he designs for prophylactic use. The press has recently reported the death of two foreign experimenters who have been victims of auto-experimentation.

I have not yet dared to treat men who have been bitten by rabid dogs (writes Pasteur [Correspondance, IV, 14, Paris, 1951]). But the moment for doing so is perhaps not far off, and I have a great desire to begin with myself, by inoculating myself with hydrophobia and then taking steps to arrest its effects, so much am I beginning to be sure of myself and sure of my results.

Charles Nicolle regards this personal sacrifice as a questionable right for the experimenter; though he himself often paid the penalty

of it in his own person:

However magnificent the purpose and however noble the example, the conservation of certain men is of too great importance to many people to make it possible to acquiesce in their sacrifice of their lives. Who could have praised Pasteur if he had inoculated himself with hydrophobia in the course of his researches? Of all human lives, was not his the most precious? Was it not the one with which he should have taken the least risks?

Of course there have been many doctors who experimented on themselves for the sole purpose of showing that a disease was, or was not, inoculable. Most often, the results were not conclusive. Thus, Desgenettes inoculated himself with the pus of a noxious bubo, in 1799, and had no ill effects; while the Englishman, White, did the same in 1812, and died as a result. In 1884, Damielsen inoculated himself with leprous matter, without result. One should also cite the experiments of Petten Koffer (1892) and Metchnikoff (1893), who absorbed pure culture media of the vibrions of cholera.

From the purely technical point of view, an auto-inoculation may meet with failure which, in certain cases, can be foreseen. This can happen in the case of some contagious diseases, where a secret immunity has been established as a result of slight and repeated contacts either with the etiological agent in the course of laboratory researches, or with patients in the course of everyday medical practice. A typical example of this is provided by the failure attending the experiments of Trousseau and Michel Peter, who fruitlessly inoculated themselves with matter from infected membranes taken from children with diphtheria. The result of these experiments was to consign again to

obscurity and ignorance the contagious and specific nature of diphtheria, which was previously upheld by Bretonneau and which was only

to be confirmed by the coming of the bacteriological era.

It is sometimes in their own family that innovators have found subjects for experiment. In England, Patrick Manson exposed his son to bites of infected mosquitos brought from Italy, and it was through that experiment that he was able to confirm, in a striking way, the anophelian doctrine of malarial contagion, the demonstration of which had, however, been given by Ronald Ross Senior, in 1896, experimenting on birds, and then by Grassi, who experimented on man.

In 1933, Mr. and Mrs. Macdonald experimented on their children, and confirmed the etiological role of the bacillus of Bordet-Gengou in whooping cough. By stopping the pharynx with filters of whooping cough secretions, they obtained no pathological symptom: a virus could not, therefore, be suspected. On the other hand, the same operation carried out with bacilli of a recent culture media gave a positive result.

Very often, the first experiments on man have been carried out in the scientific entourage of the experimenter, whose collaborators catch his enthusiasm and offer themselves as subjects. But, as Mace put it in

1898:

There is a real case of conscience for the experimenter in accepting such offers; he must always moderate this ardour to help him, which is very courageous and very devoted, but which is a decision for self-sacrifice too easily given.

May those condemned to death be used for experimentation, as was done in former times? Among the best known examples is the case of a condemned man, Kean, whose name is linked with that of the experimenter Arning in the study of leprosy. In 1885, in the Hawaiian Islands, Arning grafted a leprous tumour on Kean's body. The first symptoms appeared three months later; in 1887, Kean was declared a leper, and he died of leprosy in 1889. But, however spectacular this experiment may have appeared at the time, it was not conclusive, because the subject belonged to an Indian tribe where leprosy was not unknown.

From the purely material viewpoint, it is clear that those condemned to death could benefit by this practice. If the result is negative, the subject benefits entirely from it, since it is understood in advance that the legal condemnation to death will be annulled, whatever the outcome. Where the result is positive, the chances of cure are also considerable, since the disease may respond to treatment. Again, in a case of serious affection leaving a legacy of weakness, the condemned will simply have to endure the lot of all patients. But no law codifies the equivalence of the death penalty and of the experimental test. No official whose duty it is to administer justice can lend himself to an illegal enterprise, even though he secretly consents to it.

This practice, moreover, cannot but alter the validity of the death sentence. This sentence is pronounced only when the feult proves the

This practice, moreover, cannot but alter the validity of the death sentence. This sentence is pronounced only when the fault proves the guilty party to be so dangerous that society feels the imperative need of getting rid of him or her. If, as held by Dr. Alexander, the American expert at Nuremberg, the fact of submitting oneself to a dangerous experiment allows the death sentence to be cancelled, that sentence would not need to be pronounced. This proposition would annul the meaning and the justification of the death penalty. Moreover, the condemned must freely and willingly accept the proposition made to him. We shall see presently the conditions which can render such an acceptance valid.

Experimentation on the insane has been attempted by some doctors, and no legal text exists on this matter. But it seems that public opinion and the legislator can accept it only on certain conditions. In the first place, the subject himself cannot be consulted; he remains, therefore, under the protection of those who have charge of him, and who should safeguard his essential rights. But when this is admitted, all experimentation is not excluded. The reason for this is that such experimentation may indeed coincide with a therapeutic purpose, since it must not be forgotten that certain infectious or parasitical diseases have often a beneficial effect on the evolution of some affections of the nervous system. This inoculation performed for a therapeutic purpose has made possible a vast experimental study of malaria, but the mode of treatment which proves efficacious is not without danger. There were cases where the experimental malaria infection proved serious, and some deaths have even been reported. Hence the necessity for great prudence in using the method.

Moreover, this pyretotherapy has also been realised with other pathogenic agents: spirochetes of recurrent fever, and the virus of pustulous fever. It seems, therefore, that in the case of nervous pathology the reproduction of an infectious or parasitic disease is permissible, but it is important that the risks incurred by the subject

should not be too great and that the estimated benefit should counter-balance the real, although very often unpredictable, danger. Whatever the category to which the subject belongs, the essential condition is his free consent to undergo the experimentation. There can be no doubt that the consent of a normal individual, in good health and fully informed about all the possible consequences, would serve to remove all scruples. The question is, however, more complex.

It is important that the subject should understand perfectly the risks to which his consent exposes him; and, in most cases, this postulates medical knowledge. Moreover, as Charles Nicolle points out, such collaboration deserves a salary, and men who are totally disinterested are rarely found. What salary, then, should be proposed? This question is particularly important in the case of prisoners. We have already seen the objections arising against experimentation on those condemned to death, and objections can be raised equally against accepting a person condemned to serve a sentence. Financial reward seems a petty business; it has even a certain degrading character. On the other hand, spontaneous consent will always appear suspect, as a German defence counsel at the Nuremberg trials implied when he expressed astonishment at the great number of prisoners in American State penitentiaries who had offered themselves as subjects for malarial experimentation. It is true that the American expert declared himself convinced of the idealism inspiring such conduct; the majority of these prisoners, he said, had refused the offer of financial reward. It must be added, however, that curtailments of prison sentences were announced at the end of the experimentation.

Here is a document containing the text of the declaration of consent, issuing from the Department of Justice of the Texas prison, which was read out at the Nuremberg trials.

I agree to co-operate fully with the doctors who are to direct this study during an observation period of about eighteen months. I understand that at the end of this observation period, I shall be given an appropriate certificate of merit; the declaration of my voluntary co-operation and the fact that I have thus voluntarily rendered an eminent service to humanity, will figure in my dossier.

Finally, the fact of the subject's voluntary consent does not put the experimentation beyond reach of all prosecution. An accident may happen, even as a remote consequence, and the volunteer can argue that he has been deceived. He will find men who sympathize with him and convince him of this; lawyers who urge him to make a claim against the doctors. A scandal will ensue, and we all know what happens to revelations of this kind when the Press espouses them. (Charles Nicolle).

* * *

Such, then, are the reasons which can threaten the tranquillity and material well-being of the professional investigator, and which may well prove sufficient to arrest all efforts at experimentation.

On the other hand, what are the motives urging him on to action? The well-being of humanity? Yes, certainly; but with this is linked the legitimate pride of an adventurous mind that is able to provide a spectacular and indisputable proof of the sureness and superiority of its judgment. 'Perhaps one of the greatest medical facts of the century is about to be established,' wrote Pasteur in the course of the curative vaccination of young Joseph Meister. And yet, this genial scientist, 'at the risk of sacrificing long years of work, of imperilling his world-wide reputation as a scientist, and of deliberately incurring a painful failure, simply from a feeling of humanity,' did not hesitate to apply to a desperate case his treatment, which was still at the experimental stage.

It is difficult for a scientist to distinguish between the temptation to pride and the disinterested love of humanity.

Whatever their merits, the scientists are proud. They compensate by vanity for the niggardliness of society towards them. And as if this vanity and this mirage of posthumous glory were not enough, a great number of them accept and sanction the false courage of decorations and of titles. (Nicolle, Introduction à la carrière de la médecine expérimentale, Paris, 1932)

But the desire not to endanger a reputation consecrated by numerous previous works will be perhaps the last rein capable of controlling an exuberance of experimentation. In general, whatever the inspiring motive may be, the scientist will experiment on man only when he is morally sure that his technique is harmless.

It is only when I can say that I have successfully vaccinated a considerable number of dogs which have been bitten, that I shall dare to vaccinate men. And even so, my hand will tremble, because what is possible with the dog may not be possible with men. However, I shall no longer have any scientific scruples. (Pasteur, Correspondance, III, 446, Paris, 1951).

There are both theoretical and practical benefits accruing to infectious pathology from experimentation on mankind.

From the theological point of view, there is the knowledge we have gained on the etiology and pathogenesis of the majority of contagious diseases. Thus, for example, the etiology and contagious nature of epidemic infectious icterus has been recently fully established, thanks only to experiments carried out on volunteers by American researchers. From the practical point of view, there is the use of living vaccines today for the prevention of smallpox, hydrophobia, yellow fever, typhus, plague, tuberculosis. I know that there is little accord on some of these procedures, but what is to be substituted for them? To refuse to make use of them would be to refuse to take steps against the causes of suffering and of death.

To avoid embryopathies of infectious origin, Albaugh has proposed inoculation of girls of 14 to 16 years with German measles. Is not this act, which involves only human experimental inoculation, preferable to therapeutic abortion, 'that last act of our art still bearing the stamp of barbarity' (Portes) which is preferred in certain Anglo-Saxon countries? What difference is there between this inoculation with Rubella and the inoculation carried out by Francis Home in 1758, or the inoculation with smallpox formerly practised by the Chinese and the Indians?

MORAL PRINCIPLES GOVERNING EXPERIMENTATION

The Hippocratic oath, the only written rule governing the medical profession, was invoked several times at Nuremberg. But the accused and witnesses, as well as the judges, drew from it arguments for their own thesis. It was rather an element of discord than a categorical principle capable of deciding the question. It is incontestable, however, that this golden rule is, as an American expert put it, a moral imperative necessary to the scientific and technical philosophy of medicine which is the custodian of respect for human life and for the well-being of the patient. This moral truth is valid for all time. But should this respect for human life prevent all experimental research? Preventive vaccinations are an excellent measure for the maintenance of human health, but their application sometimes involves incidents, and even accidents. Does this mean that we must consider their inventors as having broken their oath? Like every ancient law, the Hippocratic text must be interpreted.

The first attempts at providing legal guarantee for the human person, seem to have been made in Germany. In 1937, the jurist Pasch and the doctor Trembur published a treatise laying down the conditions that would make it possible, in Germany, to compel a patient to submit to an operation or lose his pension:

-The operation must be completely safe;

-It must not be painful;

-It must be almost certain that the operation will cure the patient or

considerably improve him;

-The assurance company will pay the price of the operation, and will be held responsible for any alteration in the patient's health as a result of the operation.

It would have been a good thing if these conditions had been respected in the Nazi concentration camps.

At Nuremberg, in 1947, Dr. Alexander cited an account, drawn up for him by a representative of the Federal Security, of judgments and decisions pronounced by the American Courts regarding new medicaments or new surgical techniques which had not yet obtained a perfectly orthodox position:

-In all cases, the important question is whether the subject has consented, and whether a sufficient explanation has been given to make this an

enlightened consent;

-In the case of new medicaments or of new surgical techniques, the American courts demand greater aptitudes and more attentive care than in ordinary cases;

-The consent can be given by a parent or a guardian, when necessary;

-Experimentation on non-consenting subjects is automatically liable to criminal prosecution in the United States.

Finally, on August 19 and 20, 1947, the Nuremberg Tribunal, in pronouncing judgment, defined the fundamental principles which legalise human experimentation:

-The voluntary consent of the subject, provided he is legally capable of giving full consent, is without compulsion of any kind, and supplied with detailed knowledge of the nature of the experiment and of the risks it involves. The experimenter cannot delegate his responsibility in this domain;

-The experiment must be necessary, and impossible of realization in any other way;

-It must be prepared for by experimentation on animals, and by a profound study of the question:

-It must avoid all unnecessary suffering and damage;

-It must not presuppose the death or permanent enfeebling of the subject, except in the case of auto-experimentation;

-The risks must not exceed the real efficacious value;

-Every effort must be made to avoid all eventual damage;

The experimenter must be qualified;

-The subject must have the right to end the experiment;

-The experimenter must be ready to interrupt the experiment in

case of possible danger.

Respect for these ten principles, as the French commentator at Nuremberg pointed out,2 can exist only in an atmosphere of political, individual, and religious liberty, and they presuppose the most rigorous penalties for infraction. Yet, however praiseworthy in their intention, and in spite of their precision, these propositions cannot constitute a charter of human experimentation.

The principal condition is voluntary consent; and we have seen above the objections that can be raised against the principle of voluntary consent. How is the necessity for an experiment to be legally defined. There are certain types of experimentation where sudden interruption, on the patient's decision alone, would be equivalent to a death sentence. In such a case, would the experimenter be guilty if he continued, at all costs, the administration of a drug to an experimentally infected subject? Again, it is a highly delicate matter to decide whether a scientist is 'qualified,' and on what scientific basis is this qualification to rest? As Carrel put it, 'a specialist is all the more redoubtable because of his very eminence.'

No written law has ever been able to fix with minute precision the rules for experimentation on man. There again, it is the confidence given to the doctor, to his worth as a man of science and of moral rectitude, which in the last analysis makes the act of the experimenter legitimate. Moreover, the experimenter should know the punishments to which he exposes himself if his imprudent or venturesome experiments fail. He will then be in a position to fix the limit beyond which his experiment would be criminal. It is his religious or moral education that alone can curb his venturesomeness, and prevent him from causing injury. Nullus autem debet nocere alicui injuste ut bonum commune promoveat, said St. Thomas Aquinas.

We can discuss this problem, but no amount of discussion can provide a satisfactory solution enabling us to foresee all the cases where experimentation is justified and where it is not. 'It is a problem which should be raised; which should be scrutinised in all its aspects, and to which one could not give satisfactory, much less pleasing, answers.' (Nicolle). In a domain such as this, detailed rules cannot be fixed in advance, on pain of ruining the progress of science, and of diminishing at the same time the chances such-and-such an individual

patient may have of being cured.

An ill-informed public opinion has often condemned all human experimentation, without making any distinctions as to which kind is legitimate. Nevertheless, there is human experimentation, and fortunately there will always be, because it alone can make possible the study of the diseases that affect mankind, and the discovery of the remedies to be applied to them. But it must be emphasized that the doctor undertakes this experimentation only with great anxiety, and that his refusal to do so may be dictated by self-interest. If he definitely decides to undertake it, he does so because he conscientiously thinks that he is justified in doing so.

Conscience decides for every case, in accordance with the data of knowledge. It knows the responsibilities entailed for it; in each case, it weighs that responsibility, and when it acts, it accepts the consequences of its decision.

(Nicolle).

Docteur André Jude Médecin-Chef du Laboratoire Cenitral de Bactériologie dé l'Armée.

NOTES

¹ Pasteur, Lettre de M., Pelletier, Correspondance, Paris, Flammarion, 1951, IV, 51. F. Bayle, Croix gammée contre caducée, 1950.

Unprincipled and Irresponsible Experimentation

THE PROBLEM of medical experimentation on man has reached the public, and has reached even enlightened technical circles, in a haphazard way, through two or three poor plays and through the anecdotes of a few prisoners of war. It is somewhat as if a Martian were to descend on earth and make the acquaintance of mankind by meeting a pigmy and Siamese twins. The study of the problem begins with its teratology. The fact would be of no importance if it were merely accidental; but nothing is accidental, not even crime, not even the monstrous—and this truth we hold in common with

Jung, from whom we take this lengthy citation:

In view of the fact that every man does not live in his psychic sphere as a snail in its shell—i.e., separated from others—but is in reality bound to his fellow men by his own unconscious humanity, a crime can never happen as our consciousness sees it exclusively in and for itself—i.e., as a psychic factor which is and can be, isolated. On the contrary, it happens in a wide radius. The sensation which every crime arouses, the passionate interest shown in tracking down the criminal, the eagerness with which the trial in court is followed, all go to prove that crime has a peculiarly exciting effect on practically everybody who is not abnormally dull and apathetic. People seem to move with it, to feel themselves into it; they try to grasp it and explain it. Something has been set alight in them, and this something is a part of the great fire of evil which has flared up in the crime. Was not Plato aware, all those centuries ago, that the sight of something ugly produces something ugly in the psyche? Indignation leaps up, angry cries of 'justice!' pursue the murderer, and they are louder, more passionate, and more charged with hate, the more fiercely the spark of evil glows in one's soul. It is a fact which cannot be denied; the wickedness of others instantly becomes our own wickedness; because it kindles evil in our own soul. The murder has been partly suffered by everyone, and everyone has also partly committed it. Drawn by the irresistible fascination of evil, we have helped to make this partial, collective psychic murder possible; and the closer we stood to it and the better our view, the greater our share. In this way we are unavoidably drawn into the uncleanness of evil, no matter what line our consciousness may take. Our very moral indignation is

a sign that evil has lit a fire in our heart, and the more fiercely this fire burns the more poisonous and revengeful we shall be. (C. G. Jung, Essays on Contemporary Events. Trans. Elizabeth Welsh, London, 1947, pp. 49-50).

In the wrath of the doctors against their confrères who were criminal experimenters, in the indignation of the laity against medical experimentation on man, what Jung invites us to consider is our own complicity, whether we are doctors or laymen—a complicity the psychologist would have us consider to be as profound as our indignation is burningly intense. It is this point of view which we would like to discuss. It is perhaps one-sided, but it must be admitted that it has been rarely stated.

In the preceding pages, Jude, Tenret and Dubost have clearly demonstrated that therapists were, are, and can only be experimenters on men. They have made us feel that medicine takes a path leading in one direction, and that there is no turning back. We have gathered from their articles that there seems to be no other solution for them except to press on, nor any other way of salvation except that of experimentation, in the full light of day, in all scientific humility, with 'fear and trembling.' Unless a man is to be labelled as criminal, he must know that he is an experimenter, he must will, he must choose to be an experimenter. But we do not imply that this necessary condition is also sufficient.

But is it the doctor only who is to experiment on man? If so, how can one explain this anxiety of the layman, this sensitivity of the public in which Jung invites us to see an indication of complicity? Above all, how can one explain why this reaction is accompanied by such bad faith, why the plays of which we have just spoken are so bad, and why Court verdicts carry so little conviction, lumping together under one condemnation acts whose morality is far from being uniform? The answer is, we believe, that this complicity exists—that everyone is engaged in medical experimentation, unconsciously of course, like Monsieur Jourdain's speaking of prose.

A mid-ranking official of the Ministry of Finance fixes the reconveyance price of beet alcohol, and gives to the Public Authorities controlling it technical reasons for adopting a proposal that will satisfy certain sections of public opinion. Such an official indulges in medical experimentation. The results of this experimentation are seen in the French mortality rate, under the heading 'Cirrhoses of the Liver,' and in the morbidity rate under the title 'Alcoholic Psychoses.'

The money thus returning to the pockets of the beet growers and distillers will be replaced by money from our pockets which we deplete in an effort to cure the unfortunate drunkards, increased and multiplied by a clever political and financial move.

As a result of parliamentary debate, and in the hope, never borne out by the figures, of facilitating the financing of agricultural family allowances, parliamentarians and technicians of agriculture, of family allowances, and of finance, give France the right—which she was not claiming—to drink pastis. They are indulging in medical experimentation, and the consequences will be of the same kind as those we have just seen.

A syndicate of taxi drivers strike against medical inspection; they, too, engage in medical experimentation, and the success of their experimentation will be seen, perhaps, in an increase of fatal accidents.

A parliamentarian yields, in all good faith, to the pressure brought to bear on him by a group of patients, and he takes up the defence of a charlatan. He thereby indulges in medical experimentation, and his intellectual dishonesty will result in the death of some hundreds of tuberculosis patients.

A father is a year late in having his child vaccinated against small pox, and he thus increases the child's chances of contracting vaccinal encephalitis. He also is an experimenter on his own child.

In his quest for the sensational, a journalist writes an article to the effect that a scientist, with a foreign-sounding name, has discovered a serum that cures Hodgkin's Disease—a disease that is always fatal. Three days later, his paper announces the death of a patient to whom, it would appear, the marvellous serum had been sent by plane. But many of his readers, who are in a remission period of a disease whose name they know but nothing of its prognosis, may entertain their own opinion about the psychological and medical experimentation which has just been made. At all events, one or two of them will take advantage of the suggestion, to carry out a little experiment on themselves: they will abandon the treatment they are actually receiving—a treatment capable of giving them whole months or even whole years of remission, of apparent cure, and of practically normal life.

My friend, a surgeon, has just seen listed in his bibliography a new operative technique for the treatment of an affection which up to now has been beyond the scope of his skill. He decides to allow a

patient to have the benefit of it—and so there is experimentation on man by a surgeon on his own responsibility. Perhaps; but is he alone in thus experimenting? Is he not joined by the Administration that appoints him, by the orphanage authorities, and the local or national parliamentary assemblies who curtail our credit, and never give the doctor, and will never be able to give him, all that he needs in order to be sure of doing good? Quite clearly, he will never be without an excuse for taking no action; but the patient will die if an attempt is not made to intervene—and that attempt may be successful! And, be it understood, the paper that protests against administrative 'waste' carries its share of responsibility in this instance—as also does the reader who subsidizes that paper by buying it.

There is further matter for thought in this case we have instanced. It must be borne in mind that only the person who acts is severely attacked and severely criticized! In the enquiry entitled Médecine quatrième pouvoir? conducted by Esprit, some doctors answered Emmanuel Mounier with a great deal of perspicacity by pointing out that one noticed, not without a certain amount of sardonic amusement, that modern psychiatry was being attacked only since it became active and sought to play a curative role. Medicine was accused of violating the pathological human person by its psychological, medicinal, or surgical techniques, in attempting to cure; but, they answered, did the golden age of psychiatry coincide with its botanical and contemplative period, when it attempted nothing beyond the classification of men, women and children, who could then be neatly labelled among the chronic and the demented, without hope of one day resuming normal activity?

Severe judgment is passed on the failure of a lobotomy, of a psychoanalysis, of insulin treatment, or of a total gastrectomy, but never on the deaths and diseases resulting from sheer heedlessness and carelessness. Every death from smallpox in Great Britain should be ascribed to the Anti-Vaccination Leagues, and to the public authorities

that have given in to them.

But why speak of the Germans or the English? Was it by pure chance that famine killed only the mentally sick internees in occupied France? Will anyone maintain that two centuries of psychiatric errors could do as much damage to the insane as have the lack of provision services for them, and the indulgent indifference of the Public powers? It has not been proved statistically that Hitler's euthanasia policy

towards mental patients has unpeopled German asylums more than our indifference has unpeopled those of France.

Finally, when it is taken into consideration that certain medical problems are capable of technical solution, who will decide on whom the responsibility rests in every case of malaria, for example? Is it to be ascribed to the indifference of well-supplied countries who neglect to facilitate the export of their doctors? Or to a price-ring controlling quinine? Who can exhaust the whole litany of what the doctors, the governments, and public opinion, have not done?

In a world where abstention or indifference kills more people, perhaps, than are victims of criminal actions, who will reckon the responsibility of the timorous, of those who restrain and miss no occasion for denouncing the person who acts, and are always ready to avail of any pretext for doing so?

The reason we began by citing Jung is now perhaps clear. It is not just a matter of passive complicity in medical experimentation, but of active complicity. All are engaged in experimentation on man: the doctor on himself, parents on their children, and the authorities—legislators, administrators, magistrates and journalists—on the collectivity.

The list of participants could be continued. There are the war on opium, the Kif control, the warm wine given to the soldiers; the introduction of more modern equipment for the extraction of rocky seams in mines—a process which develops silicosis; the Maison le Corbusier, the lowering of authorised ceiling heights in buildings; a new drink; a new colouring matter or a new chemical in foods. It is a well-known fact that the Académie de Médecine and the Counseil Supérieur d'hygiene publique have been fighting tenaciously, for many years, against what they regard as experimentation, maintaining that no laboratory test of purity can be a guarantee against the harm done by regular and uncontrolled absorption of certain products continuously for a whole lifetime.

Must all these experiments be regarded in the same light? This would be to ignore an enormous difference between the several types. Take an example from everyday medical practice. I ask one of my friends, a surgeon, to perform a very serious and very dangerous operation on a patient in extremis, this being the only way of giving the patient a chance to live. We both agree that the operation is a very serious one, and that it is the only human chance the patient

has of survival. We are only men; and even though we are in complete intellectual accord, it is very highly probable that the surgeon will hesitate far more than I do, who am simply the doctor in the case. Why? Because the surgeon considers that he must play the positive role; that it is he who may cause the death of the patient. He feels that he is more involved, because it is he who is going to operate; theoretically, we are both equally responsible, but actually he is more alive to that responsibility because he feels that his part is a more immediate one than mine.

Now, the great difference between experimentation by the ignorant and experimentation by the doctor is that all those experimenters we have just listed are fully persuaded that they have not engaged in experimentation; they believe and feel themselves free from responsibility—at least from all deliberate and conscious responsibility. The frenzy with which they experiment is equalled only by the zeal with which they will stone that scapegoat—the doctor who is a dangerous experimenter. But this lack of a sense of responsibility is not the only difference; there is also a serious difference between conscious and unconscious experimentation; between technically supervised experimentation, and experimentation that does not even seek to know the results of its actions, if indeed it does not attempt to camouflage them, to drown them in some show of statistics, or is ready—a worse case—to justify any consequence whatever of any system whatever, by the resonance of high-sounding words. This difference lies in the fact that the experimentation—a conclusion which, however insignificant it may seem, will be of use scientifically; while the involuntary, unconscious, uncontrollable experimentation will scarcely ever furnish a result useful to science, after it has caused a great deal of misfortune.

There are three types of responsibility: collective responsibility, unconscious responsibility, and personal responsibility; and we are not unaware that there is a certain inconvenience, on the moral plane, in putting them under one heading. In bringing them together, we are far from wishing to add to the confusion, for we merely aim at underlining the fact that collective responsibilities are dangerous only because they go unnoticed. No one—neither State, nor syndicate, nor journalist, nor parent, nor patient—wishes to recognize that they experiment on man. There was general satisfaction in finding

Nazi Germany as this collective criminal in order to hurl an anathema against collective State experimentation. This was simpler than to admit that everyone had done the same thing; and it was indeed a very much easier matter, since it cannot be denied that the S.S. carried that experimentation to extremes. Mitscherlich and Milke have observed that it was a matter of indifference whether the initiative came from an exaggerated ideology or from an incompetent bureaucracy. (See the last article in this section). This is not entirely true, because a revolt of humanity against a sadistic caste and a murderous ideology may be hoped for—and this indeed effectively occurred in the case of the S.S. Nothing effective can be expected to rise up against the enlisting of opinion and of institutions in a collective, subconscious complicity, protected by hypocritical justifications.

Now, from the moment a collective responsibility becomes also a conscious responsibility, a certain number of consequences ought to follow on the practical plane. From the very moment when a person or a collectivity realizes that it is impossible to live without experimentation on man, there is only one course to be taken: the responsibility must be taken on. In practice, this means that an attempt must be made to foresee the medical consequences of this attitude; and, since no one is a prophet, to see to it that such experimentation is controlled by technically competent and morally independent men, so that it may be supervised by those who know what is the essence of experimentation.

The only limits of security open to experimentation are those which derive from the fact that the whole responsibility for the experiment devolves on him who performs it. Now, the only concrete and real responsibility is that of a man, a technically enlightened man, a man capable of knowing what he does, of controlling himself, of limiting to the uttermost the dangers involved in what he does. Whenever a collectivity or a layman wishes to experiment, a technically competent man must be found who is willing to be the experimenter and to perform the experiment himself.

There is a profound difference, which has not yet received due attention, between the judicial tortures of the old régime, and the modern tortures used by the police régimes. The magistrate of the old régime had to assist at the torture of the accused, and question him under the torture, thereby becoming the person responsible and the director of that torture. Modern magistrates are too exalted

personages to sully their hands in such a subordinate task. They are mild people who would not hurt a fly, and yet who telephone mysterious authorizations. Every collectivity easily finds some sadistic mentally deficients in its midst, who will carry out such authorizations in places sufficiently remote for the cries of the victims to remain unheard. I am not sure that this new condition of things increases the guarantees given to the accused.

Of course, I am only making a comparison here, and I am not demanding the reintroduction of the rack. I am merely saying that the only guarantee which can be given to subjects of experimentation—and, in the final analysis, we are all such subjects—is that the full responsibility for the experimentation should devolve on a man technically trained to assume that responsibility, completely free from all direct or indirect constraint and from all influence even of a benevolent kind; so that he may know that he is solely and completely responsible, and cannot, even unconsciously, excuse himself on the grounds of orders received from his superiors.

There are many unconscious, involuntary and uncontrolled experiments being carried out all over the world. It would be a delusion to suppose that they could be swept into oblivion with some sort of magical immediacy. To suppose that it is sufficient to parade the multitude before a pillory in which a dozen criminals, very carefully chosen, are exposed, is simply to blind oneself to the real and serious facts of everyday life. The real solution lies in never experimenting without consciously doing so; and in never regarding the experimenter as an executive, but as a man whose responsibility will be very accurately assessed by his degree of liberty—liberty in accepting his task, and liberty in executing it.

Doctor Henri Pequignot Médecin des Hôpitaux de Paris.

PART THREE

Law and Morality

L

Administrative Texts and Human Experimentation

EXPERIMENTATION ON HUMAN BEINGS is an absolute necessity in Medicine and is even one of the essential conditions of medical progress. Yet, it has determined adversaries who oppose it for various reasons. Perhaps the chief objection is one not based on reasonable arguments but on considerations of a sentimental kind, and therefore more difficult to meet.

It is not without good reason, of course, that in a country like France the sacred character of the human person is emphasized. Moreover, the idea of indulging in experiments on men offends the sensibilities of everyone.

Jurists, especially, show a general hostility to these experiments, and when they refer to them, it is generally to condemn them. They do not bother to cite quotations in this connection, being content to repeat this passage from Marie-Jeanne Rauzy:

It is immediately obvious that experimentation pure and simple should be condemned. An example of such experimentation occurs if a patient suffering from obliterant arthritis and summoned to hospital for a simple radiography, is unnecessarily subjected to an arterial injection, or a new process of radiography, death being the result. (Obligations du Médecin, Paris, 1939).

There remains the possibility of experimenting on oneself, and we know that many doctors, who have tested out on themselves the effects of a new therapy, have paid with their lives for this magnificent gesture. This type of experimentation cannot, of course, be controlled or dealt with by the public authorities. The press has reported a fairly recent example (August 17, 1951), when Mr. Jack Clifford

and Mrs. Ardys Pearson of the Laboratory of the University of South Dakota died after having undergone injections in the course of experimentation on themselves with a new medical product.

Apart from experimentation on oneself, every intervention on the human body not absolutely necessitated by disease is open to serious objections. It is no wonder, therefore, that public authorities show a certain reluctance to fix, in precisely worded texts, the conditions for human experimentation. If it is borne in mind that the law does not create public opinion or behaviour, but limits itself to sanctioning, registering and formulating them in texts binding on all, it is immediately evident that the legislator, like the Administration, must exercise great caution in a domain where unanimity is far from existing.

* * *

We shall begin with the very simple and most universally admitted fact of experimentation on corpses; and we shall then go on to consider the question of experimentation on collectivities in the form of obligatory vaccinations.

1. Experimentation on the Corpse

DISSECTION

The study of the corpse for scientific reasons goes back to a more remote period than is generally believed.

In letters dated May, 1396, carrying an injunction to the officers of Montpellier to hand over, once a year, the corpse of a person condemned to death, for purposes of anatomical demonstration² the idea of experimentation is already apparent.

... predictique officarii nostri, seu eorum aliqui, quandoque se hactenus ad hoc faciendum, reddiderint et reddant difficilius, fuit pro parte dictorum exponencium nobis humiliter supplicatum, quod, attento quod dicta anathomia habet fieri et est necessaria pro salute humani generis, et ut dicta sciencia medecina efficacius experimentatur, sibi super hoc velimus pro videre de remedio opportuno.

Again it reads:

Nos igitur, . . . pro salute humana, a dicto studio, propter experienciam quae potissime in facto medicinali rei est magistra, magistros ad se trahunt.

In the sixteenth century, scientific research indulged in practices that would not be stomached today even by the least squeamish. If the anatomist Fallopius can be believed, when the anatomists were short of subjects for dissection—and this must have been frequently enough—they were supplied with criminals whom they killed by means of opium in order that their corpses should be afterwards dissected.

Later it became customary to wait till the hangman had completed his task, before the body was claimed for dissection. Under the signature of Louis XIV, Declaration No. 713 directed that the demonstrators of the Jardin des Plantes should continue their lessons and exercises on the value of medicinal plants, that they should there carry out all dissections and anatomical demonstrations free, and that for this purpose the corpse of the first person executed should be delivered to them, even in preference to the doctors of the Faculty of Medicine.³

At the beginning of the eighteenth century, it was provided that corpses other than those of the condemned should be put at the disposal of professors. Edict No. 2031, dealing with the regulation of the study and practice of Medicine in the kingdom, 4 contains the following in its 25th article:

We enjoin on magistrates and directors of Hospitals to furnish corpses to professors for purposes of anatomical demonstrations and for the teaching of surgical operations.

This dissection of the corpse is rigorously regulated.

An order of the *Directoire exécutif*, dated January 3 Year VII (September 24, 1798), concerning the police of the anatomical dissection laboratories, 5 provides in its first article that no dissection room and no anatomical laboratory may be opened without authorization from the municipal administration.

An order of October 5, 1881, indicates the conditions in which unclaimed bodies, coming from hospitals and destined for use in the study of dissection, shall be apportioned between the Faculty and the Hospital Administration.

The regulations concerning the Health Service and the hospitals of Paris (Paris, Imprimerie nouvelle, 63, quai de Seine) contain the following directions:

Bodies claimed by families are always to be handed over; unclaimed bodies are kept, but never longer than 72 hours, for the dissection departments of the Faculty and the Administration.

Moreover, article 72 of the regulation lays down that all dissection and every surgical intervention on the corpse, are forbidden in the hospitals and hospices; and article 76 specifies that when a hospital chief wishes to carry out some research on one subject or on several subjects, he must make this known to the chiefs of the anatomical establishments which have received the bodies, in order that the body or bodies may be reserved for him and he may be given the means of pursuing the studies he desires to make, in the dissection theatres. Article 76 also lays down that hospital chiefs should complete their studies and researches within three days of the arrival of the corpse to the dissection theatre.

AUTOPSY

Autopsy, properly so called, is the study of a corpse in order to discover the cause of death. It is now regulated by article 7 of the Decree of October 27, 1947, which declares:

'However, in establishments which figure in the list drawn up by the ministry of Public Health and of Population, if the chief decides that a scientific or therapeutic interest demands it, autopsy and its accompaniments may be carried out without delay, even in the absence of authorization by the family. In this latter case, the death must be certified by two doctors of the establishment, who should use all the procedures recognized as valid by the Minister of Public Health and of Population, in order to ensure the reality of the death. They must sign the death certificate, giving the hour and date at which the death occurred.

'A certificate is to be drawn up by the medical chief, stating the motives and the circumstances of the operation.'

GRAFTINGS

The body may be used for long-term results, since it is the purpose of dissection and of autopsy to enrich the store of human knowledge, and to provide new means of fighting against such-and-such a disease. It may also be used with a view to immediate results, as for example, the grafting of a cornea, thanks to voluntary eye-donors.

This practice is legal, as authorized by the law of July 7, 1949, whose single article reads as follows:

The anatomical operations carried out on a body with a view to the practice of keratoplasty (grafting of the cornea) may be effected without delay, and in the very place of death, every time that the deceased has, by will and testament, donated his eyes to a public establishment or to a private medical work which practises or facilitates the practice of this operation.

In this case, the reality of the death must have been certified by two doctors, who should use all the procedures recognized as valid by the Minister of Public Health and of Population. They must sign the death certificate, giving the date and hour of the death, and stating the procedures used to ensure that it had occurred.

The text is a brief one, but it is remarkable for the wealth of precautions it lays down.

All this, whether it concerns dissection, autopsy, or the removing of graftings from a corpse, is relatively simple. The sacred character immediately attaching to everything that concerns the human person obliges us to treat with respect the mortal remains from which life has just departed; but it is easy, nevertheless, to entertain the opinion, without shocking susceptibilities, that one may use for the benefit of other living persons, either an organ removed from a corpse, or the experimental knowledge which dissection and autopsy can bring to the surgeon. The problem becomes more complex when it concerns experimentation on the living person.

REGULATION OF SERUMS AND VACCINES AND DISTRIBUTION OF RARE MEDICAMENTS

SERUMS AND VACCINES

The manufacture and sale of serums and vaccines are regulated by a law of June 14, 1934. Different texts were later added to decide details of application, notably a ministerial decision of June 19, 1937, which seems to be the only one to have faced up to the problem of experimentation. This decision, taken in application of article 7 of the decree of August 26, 1936, (J.O. of June 22, 1937), fixes the conditions in which every doctor who undertakes therapeutic tests with the aid of products envisaged by the law of 1934, imported or manufactured in France, and not yet authorized, must inform the Minister of Public Health of the results of his tests.

Article I indicates that every doctor who wishes to undertake on his own responsibility and for a fixed time, systematic tests with a

view to the everyday therapeutic application of new products the sale of which, subject to conditions provided by the law of June 14, 1934, has not yet been made the object of a governmental authorization, may undertake these tests and carry them out only after having been authorized to do so by the Minister of Public Health, to whom he should address a request for such authorization.

Article 2 provides that the authorization given is valid for a period of six months, and is renewable on demand and according to the

therapeutic results obtained.

Article 3 lays down that the experimenter must use these products gratuitously, without any increase in his usual fees and only in hospitals, clinics, research centres, etc., previously approved by the Minister.

RARE MEDICAMENTS

Modern discoveries have brought to light a certain number of extremely active medicaments that are unfortunately both rare and costly. The State has therefore been obliged to ensure their importation and regulate their distribution.

Whenever possible, a collective experimentation with these products has been organized. For a long time, such an experimentation was regarded as impossible to carry out in France; but it seems, however, to have been carried out, as is proved by the First French Penicillin Congress, held in Paris from August, 11 to 14, 1946. The object of this Congress was to assemble those who until then had been charged with directing treatments with this magnificent antibiotic, in order that they might have an opportunity of comparing their experimental results. A tangible proof of the results obtained can be found in the book of 900 pages published by the Ministry of Public Health, entitled Therapeutique par la Pénicilline (Masson, 1947).

Up to now, we have been dealing with the generalised use of medicaments already tested within limited groups. We now reach the properly active phase of the experimentation, corresponding to the control of medicaments that have just appeared for the first time in therapeutics.

CONTROL OF SPECIALITIES

From the moment there is question of verifying their therapeutic

efficacy, the control of pharmaceutical specialities admits, in many cases, of recourse to experimentation on man.

THE VISA

According to the terms of article 44 of the law of September 11, 1941, modified by the law of May 22, 1946, no speciality may be sold, either freely or for a payment, until it has received the Visa of the Minister of Public Health at the request of the Comité Technique des spécialités. By the application of this law, no speciality can be manufactured or marketed in France, unless it has been previously subjected to the test of a control exercised by high scientific personages.

to the test of a control exercised by high scientific personages.

In application of the decree of June 22, 1942, modified by the decree of September 13, 1945, the demand for the visa must contain, among other documents, 'a notice relative to the therapeutic tests of the product, mentioning the therapeutic indications for the product, and containing documents capable of justifying the therapeutic value of the speciality.'

When the dossier is in order, the Comité Technique des Spécialités. then proceed, in laboratories or services approved by the Minister, to carry out tests calculated to verify the quality of the product in question. It formulates its propositions to the Minister, based on the results obtained, and the Minister then makes a decision.

A decision of January 22, 1946, has fixed the working methods of the Comité Technique. Many of these clauses deal with experimentation on man with the proposed speciality. To appreciate more clearly the task of the Comité Technique, it must be remembered that, in accordance with the law, the visa is given to a pharmaceutical speciality on sale prior to September 11, 1941, simply when the Comité Technique states that it is in no way injurious to the moral or physical health of the population. On the other hand, in the case of a new speciality, the visa is given when the Comité Technique states that this speciality is of a novel character and possesses a therapeutic interest, and that it is in no way dangerous to the moral or physical health of the population. The third paragraph of article 4 of January 22, 1946, states:

This character of novelty can result notably, either from the introduction into therapeutics of a medicament not previously used, to obtain effectively the desired result; or from a new medicamentous association offering

chemical, therapeutic or technical advantages, or permitting a new and interesting mode of administration, of a product already utilised under other medicamentous forms.

The word 'therapeutic' is thus found to appear frequently in the texts. There is clearly question, therefore, of a subject which is directly concerned with experimentation on man.

THE TESTS COMMISSION

Until the last war, there was no text concerning experimentation with new medicaments on man, and both the research laboratories and the manufacturers of pharmaceutical products tried out new products more or less clandestinely, in a certain number of hospitals. It was imperative, therefore, that this experimentation should be openly organized.

Thanks to the courageous work of some leaders of the medical and pharmaceutical professions, a system has been finally drawn up which has been given a concrete form by article 4 of the decision of January 22, 1945:

Art. 4—A list is to be drawn up of experts charged with undertaking the chemical, pharmacological, therapeutic, or clinical test demanded by the manufacturer of pharmaceutical products.

This list will be drawn up by members of the Académie de Médecine, of the Académie de Pharmacie, of the Société Médicale des Hôpitaux, of the Académie de Chirurgie, of representatives of the Faculties of Medicine and of Pharmacy of Paris and of the provinces, named by decree of the Minister of Public Health.

The manufacturers who wish to submit their product to the test, must ask the Commission to name one or several experts.

The manufacturer may get in touch directly with the expert or experts designated by the Commission, which at the same time determines the fee to be paid to the expert or experts.

The experts are bound by the medical secret. They carry out, in their laboratory or service, tests on the product which must be designated by the inscription number provided. . . .

It was thus that what has since been called 'the Tests Commission' was officially set up. At the present time, the Commission functions regularly, its composition having been fixed by a decision of May 18, 1946. It has drawn up a set of internal regulations⁶, which decide in what circumstances the reports may be used and the results published, and also fix the conditions for the establishment of a programme of tests and their implementing.

Here, reproduced in extenso because of its importance, is the part of those internal regulations dealing with the establishment of a programme of tests and specifications:

The secretary informs each expert of the case to which he is assigned, and indicates to him the name of the medicament, the nature of the proposed tests, the name and address of the manufacturer. He encloses a copy of a similar type of expert examination.

The manufacturer is advised of this appointment, and a copy of a

similar type of expert examination is also sent to him.

The expert who does not accept the case must inform the Commission,

and the latter appoints another expert.

The expert who accepts the case gets in touch with the manufacturer who supplies him with all information about the nature and the complete formula of the product, including the excipient and the preservatives used as well as the degree of its purity, the means of controlling it and all the data to hand about its already known effects in pharmacology and in medicine (toxicity, stability, etc.).

In certain cases, certain preliminary tests, known as orientation tests, may be carried out, comprising only a limited number of laboratory or clinical experiments, and some more advanced tests undertaken only

with the results of the first tests in mind.

The expert and the manufacturer come to an agreement about the nature, the importance, and the maximum duration of the tests. They also come to an agreement about the fees for professional work, and, where necessary, the fees for the assistant, the technical personnel and the secretariate, expenses that may arise in reimbursing patients, expenses arising from the purchase or the consumption of materials, from the purchase and maintenance of animals, from the purchase of reagents, etc.

To this total, a certain fixed percentage is added by the Commission to cover its expenses and the expenses of the Caisse des Essais, to create a fund for the purpose of buying apparatus to be put at the disposal of experts, and to create burses designed to favour the development of

therapeutic research.

If agreement is not reached, the manufacturer or the expert informs

the Commission.

If a programme and specifications for preliminary tests or for developed tests are immediately agreed on, the manufacturer or the expert sends to the Secretary a copy, signed by both, of the scheme for the tests, drawn up on the model of the similar project supplied, figuring in the appendix.

As to the discharge of the tests, and the submission of results, the regulations give the following indications:—

The expert carries out the test in his clinic or his laboratory, with collaborators chosen by him. The responsibility rests on him.

The expert and his collaborators are bound to the strictest professional secrecy, as to the nature of the product, the tests carried out, and the results obtained.

In the course of the test, the expert and the manufacturer maintain necessary relations with each other.

The role of the expert is to verify:-

(a) the absence of toxicity or of phenomena of intolerance in the products proposed;

(b) therapeutic interest.

He must always bear in mind that his report is designed to clarify the matter for the Comité Technique des Spécialités, and he should therefore furnish in his report a sufficiency of objective details to do so exactly.

The expert's report should be inspired by the same imperatives for public health and the same directives of therapeutic deontology, as those which are binding on the Comité Technique to which the report must be sent.

It is not the province of the expert to pass judgment on any case, this being the prerogative of the Comité Technique. He contents himself with furnishing to the manufacturer, elements of appreciation which the latter can submit to the Comité Technique.

The expert must confine himself to verifiable therapeutic statements, and must not lend the support of his authority to vague and inconsistent therapeutic pretensions, such as: 'it shortens convalescence,' 'balances the neuro-vegetative system,' 'improves the general health,' etc., etc.

In every therapeutic test, the expert must compare the evolution of the disease under the influences of the medicament being studied, and its spontaneous tendency towards cure, according to the body of most recent and most serious medical literature.

Wherever a competent ministerial Commission has fixed special regulations for the testing of a medicament, the expert will conform to these special rules.

While taking great account of the results of toxicity tests previously carried out on animals, the expert should prudently assure himself of the absence of toxicity in the medicine studied when used on man; in doing so, he must respect absolutely the interest of the patient whose health must never be compromised by experimentation.

It must be remembered that the study of the toxicity of a medicament necessitates not only a clinical examination, but very intensive laboratory studies, bearing specially on the blood formula, the renal functions, the functioning of the sense organs, etc., and on the dangers from accumulation of this medicament.

It must be remembered that certain medicaments manifest their toxic effects only after a considerable time; hence the necessity, in certain cases, of a prolonged clinical study.

As to the phenomena of intolerance, whether there is question of cutaneous, hepatic, renal or blood accidents, it must be remembered that they are

based only on a limited percentage, and that, consequently, the statistical data are of great importance.

In therapeutic matters, great importance must be attached to the quality of the statistics. It must be expressly borne in mind that statistics based on a very small number of cases, are completely devoid of value.

Every expert examination must comprise a sufficient number of corroborative observations, of tests carried out on similar patients, with substances lacking in therapeutic activity.

If the duration of the test exceeds the period agreed upon, an explanation should be sent to the Commission, who are then in a position to weigh the matter should dispute arise.

We regard this set of regulations as containing the essentials of what may one day become the code of therapeutic experimentation.

COMPULSORY VACCINATION

The collective experimentation involved in compulsory vaccination raises a problem of considerable importance, the very principle of which has never been dealt with by Parliament. The legislator has therefore been led to organize that very extensive human experimentation we call vaccination, without having to take into consideration the principle involved.

We believe, indeed, that the legislator has caused to be organized, in this field, a vast experimentation aimed at defending the health of a certain group or even of a whole population. But this is not done without causing a certain danger to some individual, whose health suffers from such experimentation. When the legislator decided to make certain types of vaccination compulsory, no one could forecast with certainty all the consequences of the new legislation. Since the legislator entrusted the State with organizing compulsory vaccination, it is the administration itself that superintends this experimentation. It goes without saying that the Administration has not prepared the numerous texts that exist on this matter, without having sought the advice and followed the counsels of professional societies, such as the Académie de Médecine and the Conseil Supérieur d'Hygiène Publique. It follows, therefore, that the State must be held financially liable for accidents of which its officials are guilty, just as much as it would in the case of any other accident involving responsibility, since it is the State that organizes the public service. The liability of the State can be as much involved, for example, as it would be towards the victim of a riot.

At present, the types of compulsory vaccination prescribed by the law7 are four in number:-

-Vaccination against smallpox (Law of Feb. 15, 1902);

-Vaccination against diphtheria and tetanus (Laws of June 25, 1938, Nov. 24, 1940, Sept. 7, 1948);

-Vaccination with B.C.G. (Law of Jan. 5, 1950).

Moreover, vaccination against typhus can be made compulsory by an administrative act (ministerial decision) in the case of an

epidemic or threat of epidemic (Law of Nov. 25, 1940).

A list of the relevant texts, decrees, decisions, and circulars dealing with vaccination would be extremely long and tedious. We shall simply recall that the interference of the Administration in this matter has varied at different times. For purposes of comparison, we shall give two examples.

Vaccination against smallpox, which has resulted in the almost complete disappearance of a terrible scourge, was practised long before the law of 1902. But, while the public authorities favoured it, they were nevertheless very reluctant about measures aimed at generalising the practice. To establish this fact, it is sufficient to cite a circular of September 4, 1851, relative to the admission into hospitals of non-vaccinated persons. We reproduce it here because of its intrinsic interest8.

Monsieur le Prefet, since the time when vaccination was first introduced into France, the Government has neglected no means of favouring its propagation or of promoting an appreciation of its advantages. The Ministres du Culte have added their voice to that of the civil authorities, in recommending to the people the practice of this salutary method. Vaccine centres have been established; vaccinators, salaried or working from a motive of disinterested zeal, have travelled over the countryside, and the success of their efforts is crowned by the improvement one sees year by year.

But, among the methods used in some departments to propagate vaccination, it seems to me that there are some of a kind calculated to produce effects contrary to those aimed at, and that these methods are, moreover, repugnant to the principles of the Government under which we have the happiness to live. I refer to those decisions which exclude from hospitals and other health centres, people who have not been vaccinated; and which refuse all participation in public allowances to parents who refuse to have their children vaccinated.

It was to be expected that, in the first years following the discovery of the vaccine, such steps might seem necessary to surmount the prejudices which always rise up against the development of new methods; but, after twenty-five years, vaccination cannot stand in need of any such support

in order to maintain and to extend its happy influence over the people

and on public health.

Real compulsion is exercised if an unfortunate person is placed in the position of having to choose between the foregoing of the assistance necessary to him, and the acceptance of an operation which he regards as dangerous or illicit. A return to the master ideas of order and of liberty should, therefore, make us more and more opposed to measures such as the one I have brought to your attention. We must seek to enlighten men about what best serves their own interests; but it is persuasion, and not force, which can dissipate prejudice and ensure the success of useful discoveries.

The Administration should henceforward confine itself to measures designed to win over the people and stimulate the zeal of the vaccinators. I have no doubt that such measures will prove sufficient to conquer the obstacles which still hold up the progress of vaccination, and to extend its benefits to the whole population.

The circular we have just reproduced dates from a hundred years ago, and in the course of a hundred years, fashions and public opinion develop. A tangible proof that the Administration also develops, is contained in this extract from the circular of the Ministry of Public Health (March 4, 1950):

Although, apart from cases of epidemics, there is no legal obligation on departmental Directors to ensure the mass vaccination of children aged more than fourteen years, I do not see that anything but good can come from your complying, as much as possible, with the demand made to you in this matter by the Director of collectivities. Indeed, it is very important that as many children and adolescents as possible should undergo vaccination against typhus, and it would be very regrettable if, for any material reason whatsoever, vaccinations were not carried out.

Medical Deontology, the French Pharmacopoeia, and Human Experimentation

MEDICAL DEONTOLOGY

Precise directives on the subject of human experimentation might naturally be expected in the Code of Medical Deontology (June 27, 1947): but there is only one article referring to it, and this not in order to lay down precise rules for medical experimentation on man, but solely to prohibit all precipitate publication of new therapeutic processes, and consequently all inadequately controlled mass application. The article in question is Article 18, which reads as follows:

To divulge prematurely to the medical public, with a view to its immediate application, a new and insufficiently tested process of diagnosis or of treatment, constitutes, on the part of a research doctor, a reprehensible imprudence, if he has not taken care to put his fellow doctors on their guard against the dangers of this process.

To divulge this same process to the general public, when its value and

its harmlessness have not been established, constitutes a fault.

Deliberately to mislead practitioners or clientèle, by representing to them as salutary and harmless an insufficiently tested process, is a serious fault.

What is here demanded by this representative of the medical profession, is prudence when there is question of extending the application of therapeutic processes still in the experimental stage.

The French Pharmacopoeia

There is also only one article concerning man in the Codex, under the title: 'Normal citrated dessicated human plasma' (Codex 1949, page 581). In particular, it contains the following: '... the blood should be taken aseptically from persons (homo sapiens) previously recognized as healthy and formally declared free from all contagious diseases.' The term 'homo sapiens' appears for the first time in the French Pharmacopoeia, 1949.

We are, however, far behind certain foreign texts, such as the American Codex and the Canadian Codex, which envisage human experimentation properly so called. In particular, they deal with the experiments necessary for standardizing renal extracts. There, indeed, we find ourselves in a purely experimental domain organized by the ruling powers.

* * *

When we began to write this note, which was to be confined to the field of administrative law to the exclusion of civil law and penal law, we considered that our subject was very limited in scope. For it seemed to us, at first glance, that the legislator never had the courage to draw up rules for experimentation on man—or had even got the length of thinking about it. From the above account, however, we can conclude that in practice the Administration has obeyed a kind of incluctable necessity by beginning to organize experimentation

on man, or at least to organize its control. In this way, a door has been set ajar, which may soon be pushed wide open.

CHARLES VAILLE Inspector générale de la Santé.

NOTES

1 It goes without saying that this experimentation on self should be done knowingly and willingly. That is not always the case, as is seen, for example, in the proposal to experiment, in a dangerous and useless way, with certain drugs—proposals made by representatives of the associations of patients attached to the long-established Commission de Thérapeutiques Nouvelles. Though the attitude of these persons was motivated by noble sentiments, it has been censured in an answer to a written question sent to the Assemblée Nationale by Mlle. Josè Dupuis (J.O. of Feb. 17, 1950). The Minister, in his reply to the Deputy, recalls that 'the commission known as the Commission des thérapeutiques had been set up at the request of certain associations of patients who were convinced of the basic efficacy of certain tentative methods of therapeutic treatment.' The Minister ended his reply as follows:

It goes without saying that this Commission had neither the technical competence which would enable it to reach a clearer decision than the legally and regularly competent commissions, nor the effective possibility of carrying out genuine experimentation with the impeached products, because it is clear that therapeutic experimentation is the province

of clinicians and of laboratories, and not of a Commission.

In practice, the working of this Commission resulted only in the questioning of the opinion of the Commission des Serums et Vaccins, and in showing that no effective work had been possible within the framework provided by the decision reached.

I may add that the majority of the technicians who were an essential element of this

commission, have ceased to belong to it.

See Isambert: Ancienne loi francaise, 1934, under Charles VI, p. 766. Saint. Germain-en-Laye, Jan. 20, 1673, Archives Rec. Cass. d'Etat.

Marly, March, 1707, Rec. Cass. Archives. Bulletin des Lois, Year VII, Vol. 21, p. 29.

Published in Documentation Pharmaceutique, No. 237, year 1948.

In metropolitan France.

See the collection of official texts dealing with the protection of Public Health, edited by Doctor Ishtok, I, 239. Imprimerie Nationale, Paris.

Civil and Penal Responsibility in Experimentation on Man

MEDICINE AND THE LAW

The legal regulation of medical activity is in no way a contemporary phenomenon. On the contrary, the most ancient legislations have devoted some of their judgments to the medical art, sanctioning in picturesque ways the errors or simply the failures of practitioners. In the majority of economico-juridical civilizations, Medicine has received embryonic legislation based on the idea that the particular risks arising from its exercise demanded a certain legislative intervention.

Medical law, however, has very seldom held such an importance as it does today. In legislative or administrative texts, in jurisprudence or in doctrinal preoccupations, its problems have assumed such importance that Legal Medicine has been given a special chair in the

majority of universities.

Scientific development and progress, and the extension of the traditional role of Medicine, explain in a large measure the increased invasion of the law into the field of Medicine, and the disputes that have arisen as a result. But these are not the only reasons, and this phenomenon is, perhaps, due to causes that are more social than technical, because our age attaches to problems of public and private health an importance that seems to be unprecedented in history. Nothing is more symptomatic than the strange proliferation of novels and even magazine articles devoted to medical themes. All will agree that this popular interest is scientifically bad, and should claim the attention of the public authorities. But it reveals a *de facto* situation of which the sociologist and the jurist must take account.

This advent of 'the medical age'—we do not use the term ironically as does a certain celebrated man of letters—the social prestige and the deference enjoyed, and nearly always justly so, by contemporary practitioners, have led to their being accorded the eminent position in

the modern city that Burnham claimed for the technocrats. The public and administrative authorities have not opposed that tendency, but have so ught to use it and to regulate it. They have done so in a more or less happy way, by using the traditional frameworks, little adapted to the new material to which an attempt was being made to apply them.

The juridical force given to medical deontology provides a striking example of this method and of its consequences. The Code of Deontology had met a grudging and reluctant welcome in certain medical circles; but that reluctance did not equal that with which the traditional jurists greeted it. The latter urged, not without reason, that they were in no way qualified to penetrate the mysteries of a technique whose secrets could not be revealed to them in a few dozen articles. The judges who could not yield to these scruples found themselves in an even stronger position. Short of putting absolute faith in expert medical reports that might be coloured by some professional solidarity, the magistrates had to seek out, for the solution of the new litigation entrusted to them, the elements of their conviction in medical treatises, and glean from a professionally sealed literature those learned terms with which to embellish their decisions.

It is not surprising, therefore, that the doctor regards many juridical solutions as most inadequate, and that he finds, in the study of responsibility, that the lawyers provide him with abundant matter for astonishment, irritation, or amusement. The reading of the present article will enable him to measure the heavy penal and civil responsibilities which weighed on his illustrious predecessors from Ambroise Paré to Pasteur.

Before passing any judgment, however, he should consider the outstanding similarities existing between his art and that of the jurist. The latter, especially if he is a magistrate, is himself also a clinician who meets humanity under its worst aspects. If, in his turn, he claimed to find the elements for a history of Medicine in the fields of jurisprudence, he could present a curious picture in which charlatanism disputes with maladroitness for a place in the centre.

The jurist and the doctor must agree on a compromise, based on somewhat heavy, somewhat severe solutions dictated by social necessities. It is of little consequence that from time to time some exceptional individuals cast off these shackles, and win for themselves an undying glory at the price of violating the law, nor is it of much consequence that their success brought an ironical contempt on those

who attempted to apply the common law against them. It is more profitable to oblige heroes to run risks than to restrain those who arrest criminals. The regime of medical responsibility in what concerns human experimentation is scarcely of a nature to stimulate scientific progress; it aims solely to protect the values which, if they are not of the most spectacular kind, are none the less indispensable for all that.

MEDICAL EXPERIMENTATION ON MAN

If it is true that all definition is dangerous, it becomes much more so for a person who attempts to define an idea lying outside his province. While retaining his fears of error, however, and leaving the last word to the men of science, the jurist needs to define precisely in order to build up his argument, because his solutions (which, as will be seen later, are particularly refined) necessitate an exact interpretation of the problem put before him.

Now, nothing is more vague and less capable of objective definition than this idea of human experimentation, which in a certain sense covers the whole of medical activity. A summary examination shows that it rests partly on subjective elements, and this, for the jurist, is

the worst discovery he can make.

According to Claude Bernard, experimentation is 'an observation carried out for some purpose.' It supposes, therefore, an active intervention of the observer capable of entailing consequences that would not be produced without this intervention. This author adds, moreover, that the active element can reside in the fact that the experimenter puts himself in conditions of observation to which exceptional circumstances give a particular value. But this hypothesis is too sweeping and is of a nature to make every doctor who is an enemy of the pharmacopoeia a human experimenter.

Experimentation supposes, therefore, on the part of the doctor or the surgeon, a voluntary action affecting the physical or physiological condition of the patient. But it must be immediately added that this action must have a scientific purpose, guided by the desire to deduce from the results of this intervention a certain number of facts not

concerned with the immediate interests of the patients.

This form of experimentation is, certainly, not inconceivable and some examples of it will be met. But apart from the repertoire of the Sultan, they are rather exceptional, and they are the result of an

over simplified view of the problem. The commonest form, and the form raising the greatest difficulties for jurists, is not this experimentation pure and simple, but experimentation with a therapeutic purpose. Consequently, the definition leaves the solid ground on which it rested, to enter into the endless quest of intentions. If it is urged that the purposes of experimentation are more scientific than therapeutic, the formula will be perhaps rationally satisfying, though it will remain incapable of practical application. For it to be otherwise, a material explanation of intentions would be necessary—a notice sent to the patient, for example. Apart from that, the judge, in order to distinguish the experimentation which he reproves and to which he attaches certain consequences, will be reduced to supposing an intention for it, by the aid of feeble criteria of which the most current and the most scientifically contestable is that of comparing the method used with those in general use. The artificial character of such a quest can be appreciated, and the judge's difficulty in intermediate cases that hover on the verge between the licit and the illicit. These serious obstacles give to the jurisprudence which has been studied,3 a character of uncertainty that the precision of the formulae does not hide. These inevitable shortcomings will be excused if it is remembered that the judge must reconcile the application of imperative principles, of which he is the custodian, with his very real concern not to shackle medical activity.

THE INTEGRITY OF THE PHYSICAL PERSON

Among the principles of public order which dominate the discussion and explain the solutions of jurisprudence⁴ there is one whose importance must be immediately emphasized; the integrity of the physical person, the preservation of the human body, constitute one of the elements of social order of which justice must ensure the defence. This integrity can be invaded only by acts which are authorized by the law, and which range from the suppression of criminals to compulsory vaccinations. The exercise of medical activity constitutes one of those licit invasions, but its liceity is precisely conditioned by its directive purpose—to save human life, or at least to prevent by a local intervention an alteration in the patient's health.

The principle of the integrity of the physical person, which is penally and civilly sanctioned by all legislations, has its roots deep

in the subsoil of our civilization. From the magic of primitive societies to the Christian idea of the eminent dignity of the human person created in the image of Christ, or to the humanism of the rationalist systems of morality, a great individualist current attaches to this notion a value that up to now has scarcely been contested. The most eminent social imperatives seem incapable of lessening the impact of this principle. Take, for instance, the interests of justice and of public security. A return to the cruel punishments of former times, the applications to certain crimes of the terrible sanctions recorded in history, would certainly be calculated to reduce criminality. The use of narcoanalysis would perhaps result in the tracking down of criminals, would test the worth of sworn testimony, much more effectively than do the processes generally employed. Nevertheless, we all know the reactions of public opinion towards certain police practices, and the resistance of the courts to the use of pentothal.5 It is no matter for wonder, therefore, that the interests of science, the discovery or perfecting of a method of cure, cannot of themselves justify any and every invasion of the integrity of the human person. The Nuremberg trials which are dealt with in this volume, stigmatized the actions of certain doctors as crimes against humanity.

Perhaps it would be more fitting to speak of crimes against man. Respect for the integrity of the physical person appears, indeed, to be one of the most solid elements of personal autonomy which modern societies challenge daily more and more. No doubt one will immediately think of the growing intervention of the State in matters of public health, the imperative or prohibitive rules limiting or cancelling the jus in se ipsum which certain philosophers had claimed to have established. But, when the matter is more closely examined, this policy still preserves an individualistic aspect: if it limits autonomy of the individual, it is in order to ensure the liberty of other individuals, since liberty consists in doing what does not injure another. The social defence of physical integrity has for its object a series of individuals who cannot be sacrificed one to another: it does not constitute a collective herd-application of this principle, but a series of individual applications. This state of affairs will remain unaltered until the day when eugenics, sterilization of criminals, or human vivisection are erected into a system. All those who do not accept these perspectives should be grateful to jurisprudence for the firmness of its solutions.

But should one go farther? Does the protection of physical integrity, established in the interest of the human person, transcend this person himself taken in his individuality? In other words, does a personal consent make licit an intervention that would normally be prohibited and punishable? The classic example of a person condemned to death who agrees to submit to some dangerous experiment will immediately occur to everyone's mind. But here again, it is impossible to resolve the problem in a general way without having recourse to distinctions whose application is far from being easy. On the one hand, the value of the principle of integrity makes us recognize in it a character of public order, and declare it incapable of transactions or of renunciations. But, on the other hand, in a social life made up of constant risks for the physical person, the acceptance of certain of these risks and their juridical consecration are not only conceivable but desirable, because otherwise a series of activities would be paralysed by the perspective of the responsibilities to which such risks could give rise.

This double preoccupation has led to distinctions being made on the basis of the importance and the contingency of these risks, and their counter-balancing advantages. The acceptances of a certain and serious injury to physical integrity, without a corresponding advantage to the person affected, cannot discharge the author of this injury from his responsibility; and the same would hold good for an injury that was uncertain but sufficiently probable. Examples of this latter are when two duellists exonerate each other in advance from responsibility; or when a wild beast tamer foregoes all right to legal action against the directors of the circus, in case of accident. On the other hand, an absolutely contingent risk, compensated by an undoubted interest of the physical person, may be accepted in advance, as jurisprudence rules, for example, in the case of sporting activities.

PURE EXPERIMENTATION

Experimentation carried out on a patient for a purely scientific purpose, without consideration for his interests, is undoubtedly illicit. The Code of Deontology did not formulate this rule, but everyone admits—as an eminent author has pointed out—that a doctor has no right to use his patients as subjects for experimentation.⁷

Attempts of this kind are indeed very rare, and the literature of jurisprudence offers only a few examples. Somes of the cases present the aggravating circumstance that the experimental purpose was not the only one pursued, since the practitioner sought also to secure financial gain thereby. It was thus with an operation of aesthetic surgery undertaken for the purpose of this art by a practitioner who had carried out an operation on a woman which consisted in removing the wrinkles of the neck and hiding the sag of the breasts. With a view to eventual profit from these operations, the practitioner performed them on one side only of the patient's body, in such a way as to demonstrate eventually in vivo the merits of his method. Unfortunately, this operation failed and, according to the graphic formula of the tribunal, 'far from giving to R. the shapely form of youth, it resulted only in a miserable discrepancy.'8 The victim of this extraordinary conduct easily obtained the condemnation of this over-ingenious doctor.

That a scientific and nobly disinterested purpose animates such practices does not detract in any way from their unlawfulness, as is seen by an affair that created a great stir. A hospital chief, of very high reputation, had committed to two of his collaborators, experts in the arteriographic method, a chronic patient who was then in a state of fairly satisfactory health. The death of the patient resulted from the arteriography practised on him. The *Tribunal de la Seine* and the *Cour de Paris* found serious fault with this intervention 'because the doctor knew that it was really an experiment designed to facilitate scientific research.'9

Only the civil responsibility of the doctors was involved in this particular case. Now, it is certain that their penal responsibility could eventually be involved, under the charge of voluntary blows and wounds, or of homicide through imprudence, (Art. 309 of the Code Pénal).

Moreover, since the interest of the patient is not served by these interventions, his consent would be insufficient to exonerate the doctor from civil and penal responsibility. Jurisprudence decided that long ago in the case of doctors who amputated the right thumb of conscripts at their own request. Similarly, as regards the case of aesthetic surgery mentioned above, the consent of the woman and her husband, which the surgeon had prudently obtained, did not put the surgeon beyond the range of legal action.

THERAPEUTIC EXPERIMENTATION

The above problem presented scarcely any difficulties for jurisprudence; but it is quite otherwise when the medical experimentation combines concern for scientific research with a care for the interests of the patient. The law respecting physical integrity is equally binding here, though under a different aspect; but a rigid prohibition would mean the end of all medical progress, since it would limit Medicine more or less to methods which could be practised *in vitro* or on animals.

The necessity for reconciling these two considerations has led to solutions which may seem very artificial to a doctor, but which furnish the magistrate with a sufficiently precise framework for the study and

solution of complex cases of litigation entrusted to him.

It can happen that the doctor has no established therapeutic method for the treatment of a certain affection, and that he has no alternative except to try out a new process with the greater or lesser risks involved in doing so. Jurisprudence will not hesitate in recognizing the correctness of this attitude, even in a case where there was question of alleviating a mortal danger. When an action was brought against a doctor who had attempted to treat a case of ozena with anti-diphtheria serum, the *Tribunal de Paix d'Alger* rightly pointed out 'that the exercise of Medicine could have no further reason for being, if doctors were not permitted to try anything in extreme cases.' 10

Of course, the liceity of this intervention depends on the consent of the patient or of his relations if he is not in a condition to give it. Urgent cases are the only exception to this. Although some would like to recognize to the doctor a 'right to heal,' even against the patient's will, such an attitude would undoubtedly be criticized by the courts, and prudence would rule it out because a failure could easily be

regarded as an imprudence.

In the majority of cases, the doctor is not reduced to such desperate measures. He has a number of methods at hand, and he should, in the words of jurisprudence, choose among those that correspond to the actual state of scientific development. May he go further and try out a new process which he considers to be more efficacious and more adapted to the condition of his patient?

Jurisprudence admits, and must admit, that he may; but in order that the doctor's responsibility may not be involved, it lays down two

conditions the appreciation of which requires considerable thought. First, it demands the 'free and enlightened consent of the patient.' Without going into technical details, but with sufficient precision, the doctor must indicate to his patient the problem that arises, the reasons why he considers that a new and venturesome method is to be preferred, and what are the chances of success and the risks which it implies. 11

We may show some hesitation in accepting the soundness of this demand. It derives clearly, of course, from a logical interpretation of the medical contract. But apart from the case where the rules of Deontology make it a duty for the doctor to dissimulate his prognosis (Art. 31 of the Code), the patient's decision is of little interest, either because it does not correspond to any serious grounds, or because the doctor has unconsciously influenced the data on which it is based. The patient's consent to the therapeutic or operative procedure used, should be limited to the case where a simple and precise option can be put before him. Apart from this case, it is much better to hold, as a recent verdict has put it, that the practitioner, 'invested with the confidence of his client for a serious operative act, was completely free to choose the means of performing it in what he considered to be the best technical conditions.' 12

There is a second condition for the liceity of having recourse to a new and unestablished method. The known risks must not be out of all proportion to the advantages sought; in other words, the doctor must avoid all dangerous methods when the affection he is to treat does not raise any special therapeutic difficulties. 13

This principle seems logical, and its application an easy matter; yet it too raises delicate problems. The risk of any such method can perhaps be appreciated to some extent; but the advantage sought raises a great number of considerations that vary with the different cases. This relativity is strikingly seen in what concerns aesthetic surgery. Some tribunals have judged that a doctor cannot undertake a dangerous treatment with a view to correcting a slight physical blemish, at the request of the patient. ¹⁴ On the other hand, others have considered that it is not possible to deny to an imperfection the character of disease, and that a simple hypertrichosis (excessive growth of hair) may, by reason of the psychic troubles which it occasions, justify the acceptance of serious risks to get rid of it. ¹⁵ In every case, of course, the doctor

has been condemned if he failed to warn his client of the possible dangers involved in his intervention.

It can be seen that one simple idea inspires the distinctions juris-prudence has made in reaching its decision for the various cases. Medical experimentation on man is licit only when it serves the interests of the patient, and only to the extent to which it serves those interests. 'When no appreciable benefit can result for the patient from the attempted experiment, the doctor becomes responsible both under civil and under penal law.' ¹⁶ It matters little that this solution may appear narrow, and of a nature to limit the progress of medicine. If another attitude were admitted, the resulting scientific development would be no compensation for the new step man would thereby take on the road to slavery.

J. M. Auby

Professeur agrégé à la Faculté de Droit,

Chargé d'un cours à la Faculté de Médecine de l'Université

de Bordeaux.

NOTES

A celebrated magistrate of the nineteenth century, the Procureur General Dupin, rightly declared: 'It is not a question of discovering if a certain treatment was rightly or wrongly chosen, whether its effects ought to be salutary or harmful, whether such-and-such treatment would have been preferable, whether such-and-such an operation was really necessary. . . . These are questions to be discussed among doctors: they cannot constitute cases of civil responsibility, or come under the examination of the tribunals.' (Conclusions sur Cassation Requêtes, June 18, 1835, Sirey, 1835, I, 401). We give without comment this phrase from a fairly recent verdict: 'Given that, like all doctors, Professors X, Y, Z, are little inclined to incriminate a confrère.' (Trib. civil d'Aix-en-Province, Dec. 5, 1947. Semaine Juridique, 1949, No. 5,024). On this jurisprudence, see specially: Kornprobst, La responsabilité médicale, 1947, No. 244 et ss.

R. Savatier: Traitè de la responsabilité civile, 2nd ed., 1951, II, 388 ff.

See Cahiers Laennec, 1949, No. 4: La narco-analyse (English translation in New Problems in Medical Ethics, Vol. II, Mercier Press, 1954).

6 Cour de cassation, Aug. 2, 1950. Dalloz, 1951, p. 581, with the important note

of Premier President Mimin.

7 Ripert: Revue Critique de legislation et de jurisprudence, 1903.

8 Cour de Lyon, June 27, 1913. Dalloz, 1914, 11, 73. Note Lalou.

Tribunal de la Seine, May 16, 1935. Sirey, 1935, II, 202, and Cour de Paris, May 11, 1937. Sirey, 1938, II, 71, etc. It may be noted in passing that arteriography has now become a routine examination, but that does not affect the problem as it was then. Nov. 9, 1897, cited by E. H. Perreau. Note au Sirey, 1909. See also Tribunal

de Gray, July 29, 1873, Sirey, 1874, II, 58; Cour de Douai, May 16, 1936, Dalloz

hebdomadaire, 1936, p. 435.

P. ex. Cour de Cass. Ch. Requêtes, Jan. 28, 1942. Dalloz critique, 1942, p. 63. Cour d'Aix-en-Provence, Feb. 14, 1950. Semaine Juridique, 1950, No. 5, 423, note Vienne; etc.

18 Par ex. Genoble, Jan. 5, 1949. Gaz. Pal., 1949, I, 216.

¹⁴ Cour de Paris, Jan. 22, 1913. Dalloz, 1913, II, 73.

¹⁵ Cour de Lyon, May 27, 1936, Sirey, 1936, II, 321; Cour de Paris, Nov. 23, 1948. Semaine Juridique, 1950, No. 5,716, note Brunet.

¹⁶ Savateir: La responsabilité médicale (English translation in New Problems in Medical Ethics, Vol. II, Mercier Press, 1954).

Moral Reflection

It is a well-known fact that the sixteenth and seventeenth centuries mark a decisive transition in the history of science. From remotest antiquity man had pursued his conquest of nature; and the immense strides made in that conquest during the past two or three centuries should not make us forget the wealth of technical progress achieved by the skill of thousands of generations. After the preparatory work of Graeco-Roman antiquity and of the Middle Ages, however, it was during the sixteenth and seventeenth centuries that the vital advances were made which began a new cycle in human history. The human mind learned to reflect on itself and on its activities, and thereby succeeded in creating a method by which it could know, classify, and therefore foresee and partly control, natural phenomena. Henceforward, provided with this perfect instrument of investigation, man knew that he should search out the stable and general laws that rule the relations of things, and learn how this search should be carried out.1

But once the method had been established, its application had to be clearly defined. Was it applicable to all types of phenomena? In particular, could it be applied to living beings? For it was recognised that what characterises a human being is individuality; and it was not until the nineteenth century that man had the audacity to violate the barrier indicated by that fact. Apart from a history of the forms of life, anatomy, animal and vegetal physiology, and the chemistry of the living being, were formulated. But while the other branches of science concerned themselves only with man's surroundings, it was quickly perceived that the different branches of biology all converged on the study of man himself, because his body was not structurally different from that of the other animals.

It can be said that the chief problem of our day is the problem of liberty—that is to say, the problem of deciding how far man, who is

10117

not an individual merely but also a person, can be the object of science. The gravest consequences for the future of mankind depend on the answer to that question. More perhaps than any other human science, Medicine felt the impact of this situation; from that very moment, an internal contradiction was introduced into its exercise, and it is foolish to attempt to hide this fact today.

Nearly a century ago (1865), Claude Bernard published his celebrated Introduction to the Study of Experimental Medicine, and since then the development of medical theories and techniques has served to confirm the views he expressed. But if it is no longer possible to cure without using the experimental method in its multiple forms—laboratory analyses, radiological examinations, etc.—what becomes of the unique colloquy, the man-to-man encounter between doctor and patient, so energetically defended by Duhamel and Portes? This is indeed the torturing question that emerges from the studies in this volume. Will the patient be no more than a case, a hospital number, undergoing standardised treatments decided on by 'the white-coated men'? A machine undergoing an overhaul? And have we not here one of the serious examples of what Gabriel Marcel calls 'dehumanisation'?

There is no denying that the danger of the human person being debased by technical methodology does exist; but to judge by certain anathemata which are being hurled against modern civilization and its dreadful effects, one would suppose that humanity had just emerged from a terrestrial paradise, where existence was a delicious idyll until rudely shattered by the invention of the steam engine. As a matter of fact, Adam driven from Paradise was not less 'dehumanised' than the man of the twentieth century, because he was not less divided in himself. Our nature is a fallen nature, and therefore the political and social systems invented by men will always carry the blemish of this dehumanisation. Let us reconcile ourselves, therefore, to the fact that science will continue to progress and Medicine will remain experimental.

This implies that patients must accept certain things, and that doctors must shoulder very heavy responsibilities. We shall attempt to deal with these two points.

THE POSITION OF THE PATIENT

What happens when a man suffering from some bodily ailment

seeks assistance from a doctor? The patient is at a moment of life when he feels most intensely the burden of our earthly condition. He is a sick man, full of ill-defined but obsessive fears, and sometimes tortured with pain. He looks to the doctor for health and for reasons why he should hope. He is first and foremost in need of moral comfort, and the effect of the physical treatment can be profoundly affected by the extent to which he receives that comfort.

But, if the patient seeks support and understanding from the doctor, it is not because of the doctor's strong personality or benevolence, but because the patient takes it for granted that the doctor knows. He wants to talk to a man, it is true, but to a man of science, as the current expression puts it. By insisting too much on his qualities as a man, on the gift of sympathy he needs, one tends to forget altogether what is demanded from the doctor as a man of science, and it is important to appreciate fully what the term implies. Aristotle pointed it out ages ago, when he said that there is no science but the science of the general. We must accept that. If a patient wishes to be cured, he must agree to be regarded, not exclusively as a free being, worthy of understanding and of love, a partner in a dialogue, but also as an object, as a nature, as a body ruled by all the laws of physics, of chemistry, of physiology. It is because the doctor is supposed to know these laws that the patient comes to him. Now, as I have recalled earlier on, the science of life can only be a science like other sciences, based on experimentation and progressing only by experimentation.

Two consequences result from this state of affairs. In the first place, by the mere fact that he claims the benefit of the acquisitions of this science, the patient recognizes its legitimacy, and thereby ratifies its whole past. Now, the knowledge that enables him to be cured has not been obtained exclusively by laboratory work or by experiments on animals; it is also the result of countless observations made on other patients during treatment.

The second consequence is that, by putting himself into the doctor's hands, the man who seeks deliverance from a certain disease cannot avoid becoming what the previous victims of this disease had been. He will also become a subject of observation, of trial, of research. It is the price he must pay for his treatment, and the contribution he must make to the alleviation of humanity. It is not possible to

accept one of those consequences while refusing the other; one cannot expect to receive, unless one is prepared to give.

MEDICAL ACTIVITY

In considering the conduct of a patient who seeks the remedy for his ailment, we have already glimpsed something of the complexity of the problem; but it is, of course, by examining the activity of the

doctor that we shall see that problem in its full scope.

We would like to make it clear from the outset that we are dealing with medical activity as a whole, whatever the qualifications of those who participate in it; we regard it as the activity that has for its object the healing of men. (Pasteur was not a doctor, and yet it was he who was morally responsible for the application of his treatment for hydrophobia to young Meister). Distinctions will be made if they are necessary.

The first principle dominating the whole question is that medical ethics exists and must exist. This statement will not surprise the readers of these articles, because if there is one idea pre-eminent in all the studies by doctors in this work, it is a pre-occupation with the investigation of the moral aspects of experimentation. It is a great encouragement for the person who must treat the question ex professo, to find himself in complete accord, in fundamentals, with the medical men. It is very rarely nowadays that one finds professional men of the various technical branches—scientific, political, economic—manifesting such concern. And when they do, it is still more exceptional to find them attempting to posit clearly the data of the problem, such an attempt being an indispensable preliminary for obtaining a correct solution. In all frankness, the report on experimentation presented very recently to the Academy of Medicine, and the discussion that followed during the first session, present us with a magnificent example of confused ideas. It is, therefore, indispensable to state clearly the essential aspects of this medical morality.

The first aspect seems to be a truism. And yet, the imperative force of the duty of one's state is so generally forgotten in our time that it is not surprising to find singular failures on this point among the doctors. This first truth is that if anyone consults a doctor, it is in order that the doctor may treat and cure him. The doctor should therefore employ every means, at least the ordinary means then

at his disposal, to meet the patient's needs; and consequently, he should know those means thoroughly. But that is not all. A science is something that grows continually; to know, the doctor must not only keep his knowledge up-to-date, but must also investigate for himself, so that he may build up a fund of observation and of experience. Reflection and comparison are fundamental to medical activity. The doctor who abandons them is no longer more than a robot, and is a danger to his patients. He is no longer properly exercising his profession.

A question must certainly occur to one's mind. Does not this statement contradict the traditional conception according to which the doctor is a man of art, that is to say, a man whose principal quality is the intuition which synthesizes concrete data in order to assess the individual pathological situation? It is this which is expressed in the current maxim that there are no diseases but only patients.

Does this involve a contradiction? No; it merely points out a complementary aspect. There will always be a place for art in medicine, even after the use of the most evolved apparatus, because the course of life can never be compelled to take the direction of a ready-made formula yielding an automatic interpretation. There will always be a place, in observation and in diagnosis, for the personal gifts that inevitably make one doctor more skilful or less so than another. Why has such and such a practitioner, with no fanfare of degrees to his name, been able at a single glance to discover the root of the illness, while his confrères, in high places and no doubt conscientious, have examined and re-examined the patient without being able to reach a diagnosis? It is because he possesses certain aptitudes, strengthened by constant work, while the others are less endowed or less mentally active.

But these basic talents will be exercised to the utmost of the means available, only if they rest on a science that is as vast as possible. And if this were not indispensable, it would remain only to close the Schools of Medicine and call in the quack doctors and the healers.

Medicine, therefore, already makes progress through the daily, commonplace works of even the humblest practitioners. It seeks and finds new ways.

But more is needed. The medical body would fall down on its task, if it did not contain the investigators, the experimenters, properly so called. Science demands this, but it is no less emphatically demanded by medical morality. As the circular of the German Ministry of the

Interior, dated February 28, 1931, puts it: 'The doctor should be conscious of his responsibility to seek out new methods, when the methods at his disposal prove insufficient.' And there is no need to insist on how often our present methods lag behind the diseases that afflict humanity.

The second element of medical ethics constitutes its very basis. It is simply, however, the application in therapeutic practice of an essential principle of all human morality. This principle can be formulated in different ways, but let us word it simply by saying that it concerns the absolute respect of the person, both in ourselves and in others. The character of being a person makes man a being apart among living beings, and nothing can justify the setting aside or the despising of this character. And note that, apart from our direct relations with God, it is always the concrete human person that is the immediate criterion by which our actions should be judged. In other words, our social relations are always man to man, and to decide their moral value, the only question to be asked is: Do we act towards this other person according to the demands of justice and of charity? The highest motives, the pursuit of the most exalted purposes, the production of economic good, scientific research, the future of one's country or of humanity—none of these can dispense us from this first duty. Even the safeguarding of the Faith and the propagation of the Gospel do not justify, under any circumstances, the least violation of the fundamental rights of the human person. Today, we regard the Inquisition as having sometimes been unfaithful to the spirit of Christ, because, in certain epochs and under the excessive influence of certain prejudices of its day, it ignored this principle.

In the medical context, this brings us back to the singular colloquy of which we spoke above. The present organization of Medicine demands numerous chemical and biological examinations, collaboration in work, and consequently a certain anonymity in therapeutic activity which is in danger of reducing the patient to the level of a disturbed mechanism; but this must not make us forget the truth that a man or men, responsible for his or their actions, is dealing with another man who possesses an absolute right to respect, to justice, and to charity. It may be said that everything is permissible which does not violate this right, and that nothing is permissible which violates it.

Mitscherlich and Mielke, in their book on the Nuremberg trials, have seen perfectly that the whole crux of the matter is in this; their

conclusions are reproduced at the end of this volume. 'The relation between the doctor and his patient,' they write, 'is a fundamental and immutable relation between individuals. While social structures change in the course of history, this relation belongs to those human encounters whose type is eternal, as for example, the relation of

lover to beloved and of master to pupil.'

There is much talk today about laying the foundations of a new organization of medical practice; and it would be a good thing if doctors began by considering the matter from the patient's viewpoint, and asking themselves how best to safeguard his right to be treated, in all circumstances, as a human being. Too often it happens that the doctors become absorbed in corporative claims, platonic in many cases and deliberately ignoring inevitable social changes, when indeed such claims are not mere self-interest.

But what do we mean when we say that the proper quality of man and his absolute rights are to be respected? There is the well-known maxim of Kant: 'Act in such a way as to treat humanity, both on your own person and in that of others, as an end, and never as a means'—a fundamental maxim which, however, is as yet too general.

The question more or less explicitly raised by the present discussion is the determination of the actual content of this maxim. When does such and such an action reduce a person to the level of being only a

means? We cannot treat the problem fully here.

These preliminary considerations enable us to see more clearly how we should embark on the discussion of experimentation in Medicine. The subject seems to comprise two parts: experimentation on the patient, and experimentation on the healthy person.

EXPERIMENTATION ON THE PATIENT

It is necessary to reject out of hand a distinction made by some moralists and doctors. They hold that true experimentation, in the strict sense, exists only when, apart from all immediate therapeutic purpose, an attempt is made to verify an hypothesis by means of experiments on a healthy person.

But we have already seen that this definition of human experimentation in Medicine is too narrow and does not correspond to reality. If experimentation means the attempt to verify a preconceived idea, an hypothesis, this attempt can be made as directly in medical or

surgical practice as it can on a healthy person. The therapeutic intention and the profit the patient may derive from this attempt does not affect in any way the methods used. Experiments on animals should undoubtedly constitute the first stage. But the effect of the technical articles composing the principal part of this book is to show that this preliminary stage is far from removing all uncertainties; and that, after the most complex experiments performed in the laboratory, there remains in many cases a risk, a risk very difficult to assess, when the experiment is applied to human beings. Charles Nicolle has dealt clearly with this matter in his Course at the *Collège de France*, but it seems that the book in which his conferences were published (1934) has not been given the attention it deserves by the moralists.

When, therefore, in these circumstances, a man is to be treated, the doctor is not completely in the dark, it is true, but the hypothesis has not been entirely verified, and it is that hypothesis that must guide therapy. Consequently, experimentation continues; especially as, in the ordinary course of events, one single attempt is not enough to discover the effects of a procedure, and especially of a remedy. Perhaps thousands are needed. Can it be said, for example, that definitive conclusions have been reached for the use of antibiotics?

In these conditions, the moral rules that should govern the use of new or dangerous therapies, appear easy to formulate, though in practice their application will never be mathematical, and the final decision will rest with the doctor competent to give it.

- 1. The use of any substance whose effects are completely unknown and which has not been tested on animals is absolutely forbidden. Tentative experimentation must first be carried out on an animal. Only when definite knowledge of the elements used has been gained, may experimentation with those elements be carried out on human beings.
- 2. Even when the obscurity and the risks remain, a comparison must be made between the patient's condition and the known effectiveness of the already established therapeutics, between the risks entailed by the new method and the chances of success. The more desperate the patient's condition; the more the established methods are useless or almost useless in his case, the greater right one has to attempt to cure him or to prolong his life or at least to better his condition by methods of treatment that may also have the opposite effect.

3. The consent of the patient or of his legal representative becomes all the more necessary in proportion to the danger of the medical treatment or surgical intervention. But the doctors are certainly within their rights when they ask: consent to what: In the majority of cases, only the man of science is capable of appreciating all the data of the problem. Not even the lucid patient or his parents can understand perfectly what one aims at doing, and what dangers and chances of success are involved. At least, it is indispensable that the patient be informed of the extra risk attending this new method, especially when it is a risk of death.

4. The doctor must never treat as guinea pigs, as subjects for experiments from which they themselves derive no benefit, those patients whose cases are hopeless, who are already close to death, or who have no longer any parents or anyone to take an interest in them; nor must retarded children committed to the Public Assistance be so treated. These are not pieces of human wreckage, but men who have a greater right to our charity because they are in a state of greater abandonment. To reduce them to the level of laboratory animals

is to show an unmitigated contempt for man.

5. It is all, therefore, a question of conscience for the doctor; and this presupposes that he has a clear idea of the rights of his patient, and that he does not abuse his own methods. Why is it that, in analogous situations, one doctor is guilty of criminal conduct by trying out a new technique, while another is praised for doing so? The reason is that the first has not acquired, through work and experience, the right to experiment with the new technique; while the second has behind him a long line of research and of reflection. The first makes a show of being very up-to-date, in order to appear master of the situation in the eyes of his patient or patient's family; while the second is a true man of science. Conscience is justified here by knowledge.

A reference to the article by Professor Auby will show that, in the case of therapeutic experimentation, the present provisions of our legislation correspond almost point for point with the demands of

the moral law.

EXPERIMENTATION ON THE HEALTHY

This heading does not embrace all the questions with which we deal in this section; for our subject is extra-therapeutic experimentation,

experimentation which does not immediately aim at the amelioration of the subject who undergoes it. It is clear, therefore, that such experimentation could be carried out on the sick as well as on the healthy; nevertheless, our heading serves to underline the essential

problem.

The experiments to which we refer will most often take the form either of the inoculation of subjects, with diseases from which, up to then, they had been free, and a subsequent attempt at treatment; or of investigations to discover the effect of certain substances absorbed or injected into the human body. Long ago in Breslau, for instance, the pus of venereal chancre was introduced into the wounds of children and of adults, to discover whether secondary syphilis was contagious.

In French Law, as M. Auby informs us, this kind of experiment, even with the consent of the patient, is certainly forbidden and is liable to prosecution before the Courts. Not less criminal are experiments performed on those condemned to death, or on conscientious objectors. The only legal type of such experimentation

is the experimenting on one's self.

But if we consider the matter from the viewpoint of natural morality, with no reference to positive legislation, do we find the same

prohibitions?

The theologians who have studied these questions distinguish two classes of subjects: those condemned to death; and the others, including the experimenter himself. And it seems to us that the solution of each of these demands certain reserves and modifications.

Even the most serious experiments performed on those condemned to death do not appear to be opposed to the natural law, according to the theologians. Father Payen writes in his Medical Deontology, No. 83:

If it is necessary for the progress of science, and consequently for the good of humanity, to verify on man a scientific hypothesis which has not yet been established, the doctor may, with the consent both of the patient and of the public authority, test out the hypothesis in question on a subject justly condemned to death.

This was indeed done in the past, on more than one occasion and in the name of this principle. Besides the cases listed by M. Albert-Brisson, one could instance the case of the *franc-archer* of Meudon, in 1474:

This unfortunate man was condemned to be hanged (writes Forgues Au seuil de la Chirurgie, p. 33 ff.), and it was discovered that he was afflicted with lithiasis of the kidney or of the biliary apparatus. The Parisian surgeons sought authorisation from Louis XI to operate on him, in order to carry out an examination (a biopsy, we would call it today) of the lesions corresponding to these symptoms, a matter in which there was great interest considering that many of the townspeople were 'much exercised' by the same disease. . . . The royal assent was given; the patient was opened and then stitched up again 'after the source of the said diseases had been seen.' Happily, the archer recovered. He was given a complete pardon and 'even some money.'

But, as Dr. Jude remarks, quoting Dr. Alexander, how is it that the moralists and doctors who defend this experimentation as morally correct have not seen that this practice is the very negation of the legitimacy of the death penalty. The supporters of the death penalty advance, as their principal argument, that the malefactor has cut himself off from human society because of the enormity of his crimes; that he has lost the right to the amenities provided by the community, and that capital punishment is alone capable of curbing the unleashed passions of certain people. And now such and such a condemned person, unworthy to live, can still have his place in social life! But if it is admitted that a criminal can atone for crimes entailing the death penalty, by submitting to dangerous experimentation for the good of humanity, why not recognize other methods by which such a person can make atonement?

If Catholic moralists have admitted the legitimacy of performing operations on those condemned to death, they have, on the other hand, brought in an almost unanimous verdict of inadmissibility with regard to all other investigations where the intention is not immediately

therapeutic.

'Following Liguori, who himself reproduced the doctrine of his predecessors,' says Father Payen, 'there is not a single professional moralist who does not forbid, on the grounds of experience, everything which certainly or probably involves serious and irreparable consequences for life and for health' (2nd ed., p. 182, note 1). The consent of the person concerned does not change in any way the unlawfulness of the action.

It may be asked, however, whether the theologians who have dealt with this question—apart from some recent authors, such as Father Payen himself—were sufficiently aware of all the elements involved.

The majority wrote at a time when the scientific method scarcely existed as yet; they dealt with the question in too sketchy a manner, and some of the solutions they put forward in a few terse phrases have already been generally discarded. For example, in one of the texts quoted from St. Alphonsus Liguori by Father Payen, this moralist teaches that it is never permissible to do anything whatever, which is in danger of accelerating death. Now, in connection with the use of anaesthetics, Father Payen writes (No. 203):

Of course, an exceptionally serious reason would alone authorise a doctor to give in these circumstances a dose of morphia which, while not fatal—it would never be lawful to give a fatal dose—could result in the acceleration of death.

On the other hand, the same author rejects experimentation, on the assumption that it always results in death or in serious infirmity. This is to reduce the problem to the extreme, to simplify the task of assessment, and submit the best part to a just reprobation.²

It seems to us, therefore, that the question could be submitted to fresh examination, and that the theological tradition has not such authority as would warrant its acceptance without discussion.

A few points appear to be easily established:

- I. No distinction is to be drawn between experimentation on oneself and experimentation on others. The same laws of respect apply, whether with regard to one's own life or to that of another. Consequently, one cannot carry out an experiment on oneself which one would judge immoral if performed on another person. But if the operation is permissible, there is no objection to using oneself as the first subject for experimentation.
- 2. If one wishes to experiment on another person, it is morally necessary to obtain the consent of that person. On this title alone, the Nazi experiments were already in conflict with medical morality. But this consent should be fully given, and that is why experiments performed on prisoners who offer themselves voluntarily should be treated with caution. It is obvious that the prisoner is not a completely free agent, and the advantages he hopes to gain by submitting to an experiment inevitably act as an influence on his free will.
- 3. Here, as with experiments performed in an attempt to cure the patient, experiments that have not been sufficiently tested on animals are to be forbidden absolutely as gravely imprudent. Today, the stages of the scientific method are sufficiently well-known to be

binding on the conscience of the scientist. Precipitancy, and the vain desire to forestall others in achieving success, are not excuses but indeed aggravating circumstances, if one rushes without sufficient preparation into experiments that endanger the life or even the health of human persons. The application of such an experiment to man must be undertaken only if it is clearly the last step to be taken in order to establish the value of a method of prevention or of therapy.

4. Whenever possible, it is preferable not to choose the healthy, but to choose patients who are afflicted with the disease one wishes to treat, and for whom the available methods of treatment are useless or insufficient. In this way, the risks necessarily involved can be compensated for by a probable improvement in the patient's condition.

5. There is scarcely any need to add that experiments which involve,

not a risk, but a quasi-certainty of death, are never justified.

It is relatively easy to draw up negative rules, to indicate what is forbidden; but it is not so easy to determine in each particular case whether such and such an experiment is lawful. The doctor must be first aware of certain prohibitions; and after that, it is his province to decide whether, in the given circumstances, he still respects the limits set down by morality.

Thus, for instance, among the examples of experimentation given in this book, it seems to us that it is perfectly lawful to attempt, by submitting oneself to mosquito bites, to discover the agent of transmission of a disease that one is well armed to meet effectively. The same is true for the use of vaccines, since human application is always necessary and this application can only be made to healthy persons.²

In war, many destructive actions are tolerated, and many innocent lives are lost or menaced. In view of this, would it not be permissible, for the cure and solace of men, to submit oneself to certain risks, even relatively serious risks, or to submit others to such risks?

For more than two centuries, science has had a clearly defined method. It is by adhering faithfully to this method that science will make new discoveries, and give to humanity an increased power over matter and over life.

But science, any more than state, race or class, is not an absolute. Those who attempt to enlarge the domain of science by research, and those who use the results already obtained, are bound to submit to the demands of the moral law; otherwise, they will transgress the first duty of man. These demands, where they concern social relationships,

are always carried into effect by the practice of justice and of charity. No scientific progress can ever justify the disregard of this ideal. A scientist who desired to escape from this imperative, would be no longer any more than an instrument for the worst of tyrannies.

But is not this equivalent to shackling scientific work, by diminishing the liberty of research? Perhaps this is so, on some particular points and for a time. But if the whole of scientific work is considered, we believe that it has nothing to lose if the scientist and the practitioner are inspired by a true love of mankind. And in any case, humanity itself has everything to gain by it.

E. TESSON, S.J.
Professeur à la Faculté de Théologie de Paris.

NOTES

But why do the theologians give different solutions for cases which, at first sight, seem to raise almost the same problem?

Let us leave aside the case of the person condemned to death, the discussion of

which would be too lengthy.

When moralists hold that it is lawful to expose a patient to serious risks for the purpose of curing him, they rest their case on a principle known as the principle of double effect. This principle is often ill understood by the general public, and its justification requires a lengthy explanation with numerous examples. It can be formulated as follows: When an action has several immediate results of different moral value, some in conformity with ethical requirements and some running counter to these requirements, one may act with a safe conscience, other things being equal, if one respects the essential rule that a good effect must never be pursued and attained by means of another effect that is bad. At the very most, one may accept the simultaneity of the two effects.

Thus, for example, when one uses a remedy still unestablished to treat a patient, one seeks the cure that one seriously believes to be possible, at the same time incurring

the risk of an opposite effect.

On the other hand, it will be objected, this primordial law is not respected when the experiment has no immediate therapeutic object and is carried out on a healthy person. Of the two effects of the action, the one that conforms to the moral law—the scientific progress made, the good done for humanity—will be obtained only through the bad effect—the serious deterioration in health, and perhaps even death. It is this reasoning which appears to us to be debatable; because there is no longer a question of certainly provoking a gravely injurious effect, but rather of running the risk of doing so 2 It is only fair to note that Father Payen, whose severity towards extra-therapeutic experimentation we have recorded, admits investigation of vaccination, because this has for its object to preserve from the disease the man who serves as subject for the experiment.

PART FOUR

Documents.

Ĭ.

Experimentation in Nazi Germany from 1940 to 1945

On November 5, 1946, there began at Nuremberg the trial of the German doctors 1 who, in defiance of every human code of ethics, had become forced collaborators with the Nazi regime. The verdict was brought in on 20th and 21st of August, 1947. Twenty-three accused came before the Court: Directors of the Major Health Services of the Reich, of the Army or of the S.S.; Professors of the medical faculty; Concentration Camp doctors. Many of them were condemned to death, and sentence of execution was carried out on June 1, 1948; others were given prison sentences of 10, 15 and 20 years; and only a few were acquitted.²

The experiments carried out by German doctors in the course of World War II, can be classified under the following headings: aeronautical experiments, chemical experiments, various medical experiments, surgical experiments, experiments on contagious diseases.

AERONAUTICAL EXPERIMENTS

These experiments were carried out by doctors of the Army, Air Force, and S.S., with the consent of the inspectorate of the Army and Air Force Health Service. They comprised, in particular, experiments on the effect of high altitudes and experiments on refrigeration.

Experiments on the physiological effect of high altitudes

During the first half of the year 1942, experiments were carried out at Dachau, in a low-pressure room installed in the heart of the

concentration camp. The human guinea pigs used for experimentation by Army, Air Force, and S.S. doctors, were the internees of the camp, 180 to 200 of whom were submitted to experiment, about 80 dying as a result.³ On May 15, 1941, Dr. Rascher wrote to Himmler:

It is a pity that we are unable to experiment on human beings, because these experiments are very dangerous and therefore no one volunteers. . . . Could you put two or three professional criminals at our disposal for purposes of experimentation? . . . The mentally defective could also be used as experimental material.4

Experiments began at Dachau on February 22, 1942. According to one of the witnesses for the prosecution, Russians, Poles, Germans, and Jews of various nationalities were used for these experiments on the effect of high altitudes. All the foreigners were political prisoners.

In its judgment pronounced on August 20, 1947, the Medical

Tribunal of Nuremberg declared:

It appears that two distinct groups of prisoners were used in the course of the experiments. The first comprised 10 to 15 internees, known to the camp by the name exposure subjects or subjects for permanent experimentation. The majority, if not all, were of German nationality. These men, imprisoned as criminals, lived together and were well fed. The experiments carried out on this group had no mortal or even serious consequences.

The other group consisted of 150 to 200 internees chosen at random and forced to submit to experimentation. Among the latter, of whom no

one was a volunteer, 70 to 80 were killed. . . . 5

The experimenters, Rascher and Romberg, showed not the least sign of humanitarian feeling. They pursued their experiments with a remorseless logic, just as though they were experimenting on animals.⁶

The majority of these experiments were unlawful, even in view of

the practical results which it was hoped would be obtained.

The slow descent from a high altitude has been vigorously criticised by the American expert Ivy, because of the prolonged exposure of the brain to an atmosphere whose oxygen content is low. In the United States, the same experiments have been carried out, but oxygen has been used; and the American expert declared it possible to establish, by means of calculations the precise altitude at which oxygen is necessary. He also considered—and this is an important point—that the slight difference between experiments on human beings and experiments on animals, does not justify dangerous experiments on human beings.?

Experiments on refrigeration

During the Battle of Britain (1940-1941) a great number of

German fliers were compelled to parachute over the North Sea. Even among those who were picked up, the percentage of deaths was high. The Air Force, therefore, from the beginning of 1942, was especially concerned with experiments on refrigeration. Moreover, the winter campaign in Russia (1941-1942) raised many therapeutic problems concerning the effects of cold.

The inspectorate of the Army and Air Force Health Service appointed Holzlohner, 8 Professor of Physiology at Kiel, to direct these researches in the concentration camp of Dachau, giving him as assistant, Rascher, who at the same time was carrying out experiments on the effect of high altitudes. Rascher sent a first report on the refrigeration experiments to Himmler, August 15, 1942:

The subjects, dressed in complete flying uniform and with a winter or summer kit and flying helmet, were immersed; a rubber or kapok life-saving belt prevented them from sinking. The experiments were performed in water whose temperature varied from $2\frac{1}{2}$ degrees to 12 degrees. In one series of experiments, the bulb and the brain were kept above water, while in another series, the occipital region and the bulb were kept under water.

Electrical measuring instruments gave temperatures of 26°4 in the stomach and 26°5 in the rectum. Death resulted only when the bulb and the occipital region were both immersed.

In fatal cases, the autopsy always revealed the presence of a cranial haematome, half a litre in volume; the heart invariably showed an extreme dilation of the right ventricle.

Where the temperature reached 28 degrees, the subjects invariably died in spite of every possible effort to revive them.9

According to the witness in the Neff case, eighteen subjects died in the course of the first experiments. Rascher continued his experiments until May, 1943.

These experiments were carried out by using either humid cold or dry cold. The subjects, naked or dressed in different flying uniforms, were plunged into icy water, or were exposed naked for whole nights in temperatures well below zero. Two to three hundred subjects were used, among whom were political prisoners and prisoners of war; and eighty to ninety of them died.

A very long report 10 on the refrigeration experiments, signed by Professor Holzlohner and by Drs. Rascher and Finke, was sent to Himmler on October 10, 1942. This report comprised the following chapters: Protocol of experiments—Clinical Synopsis—The blood, the

cephalorachidian liquid and the urine during refrigeration—Influences of medicaments—Preventive measures—Life-saving belts.

On February 17, 1943, Rascher sent to Himmler the conclusions

of his experiments on dry cold:

I am at present concerned with proving that subjects frozen by dry cold can be restored as quickly as those frozen by immersion in cold water. I have carried out this experiment because of doubts cast on the validity of my experiments by Dr. Grawitz, Reichsarzt S.S. The latter desires at least a hundred experiments. Up to the present, I have chilled for nine to fourteen hours, a hundred naked men left in the open air until a fall occurred in body temperature of 27 to 29 degrees. I have revived these subjects with a warm bath.

There is no need for us to stress the tortures represented both by immersion in an icy bath and by exposure to dry cold. Rascher himself demanded that these experiments should be carried out at Auschwitz, where the size of the camp provided places sufficiently remote for the cries of the victims to remain unheard.

Here, as in the case of experiments on the effect of high altitudes, the results sought in no way necessitated, it seems, recourse to experimentation on human beings. One of the experts before the Medical Tribunal stressed the fact that, in this domain, experimentation on animals had never been radically exploited, nor had sufficient observation been made of those rescued frozen from the sea, or of soldiers from the Russian front already mutilated by cold.

CHEMICAL EXPERIMENTS

Experiments with yperite

On April 9, 1942, Sievers, General Administrator of the Ahnenerbe, 11 made known to Professor Hirt 12 of the S.S., Professor of the Medical Faculty of Strasbourg, that Himmler was particularly interested in experiments with yperite. 'We shall certainly put at your disposal, for the continuation of these experiments,' he wrote to Hirt, 'exceptional facilities analogous to the special secret experiments now practised at Dachau.' 13 Hirt immediately replied that he was ready to undertake these experiments, but that it was indispensably necessary that he should have facilities for experimentation on human beings.

In his deposition before the Medical Tribunal of Nuremberg, October, 1946, Dr. Rudolf Brandt¹⁴ made the following statement in connection with the first experiments with yperite on human beings:

Towards the end of 1939, experiments were performed in the concentration camp of Sachsenhausen on persons who were certainly not all volunteers. Their purpose was to discover the efficacy of different treatments for burns caused by yperite. During the second half of 1942, Hirt, Professor at Strasbourg and collaborator at the Ahnenerbe, carried out, with Dr. Wimmer, experiments on the internees of the Natzweiler concentration camp, who were chosen haphazardly by the Pohl services. At Sachsenhausen and at Natzweiler, many internees died as a result of these experiments. . . .

The internees subjected to experimentation with yperite, were not for the most part of German nationality. Poles and Russians, as well as Gypsies and Jews, were frequently used. The racial policy of Himmler demanded the use of non-German nationals, except in the case of political dissenters and criminals.¹⁵

The following are details about experiments with yperite, furnished by Ferdinand Holl, a witness before the Medical Tribunal. He was a political prisoner who had been employed at the research station of the Ahnenerbe at Natzweiler, situated in the vicinity of Strasbourg.

In the course of the first experiments, Professor Hirt and the Air Force Officer who performed the experiments completely stripped the prisoners, who then went one by one into the laboratory. I had to hold their arms, and a drop of liquid was placed about 10 cm. above their forearms. Having been thus treated, they passed into a neighbouring room, where they had to stand for an hour with their arms extended. About ten hours later, burns began to appear and extended to the whole body. At every place where a drop of gas had touched the body, burns made their appearance. Some of the victims became partly blind.

Their suffering was terrible and almost beyond endurance. It was almost impossible to remain near them. The burnt parts of their body were photographed every day, and it was about the fifth or the sixth day that the first death occurred. At that time, the dead were still sent to Strasbourg, since our camp did not have a crematorium. Nevertheless, the corpses from these experiments were returned and dissected at the Ahnenerbe. The greater part of the lungs and of the other organs had been destroyed. In the course of the following day, seven other victims of experimentation died. This series of experiments went on for about two months.

Simultaneously with these liquid yperite experiments, other experiments were carried out with yperite gas:

Each subject was handed a little phial, I to 2 cm³, and had to carry it into the gas chamber which was about 500 metres from the camp. Two at a time went into the chamber which, of course, was then closed. One of the prisoners had to break the phials, and thus inhale the gas which escaped, as a result of which they both lost consciousness. They regained consciousness and returned to the Ahncnerbe, where the treatment continued

and where the progress of the malady was observed. The results were patently the same as those produced by liquid gases. I sometimes used oxygen in order to make the organs of respiration function again. Some subjects died from lack of air, because we were not successful in our attempts to restore them; but they showed the same kind of burns as in the first cases. I have seen the lungs of people who had been dissected; they were the size of half an apple, and were completely corroded and full of pus. While I was there, that is until some time in 1943, a period of about a year, 150 subjects or thereabouts were treated in this way. 16

For this second series of experiments, Holl gives the death roll as from 30 to 35.

The experiments continued until the evacuation of the Natzweiler camp at the approach of the American armies in the Autumn of 1944.

Experiments with Phosgene

In this same laboratory of the Ahnenerbe at Natzweiler, other experiments with phosgene were carried out. Bickerbach, Professor at the Medical Clinic of the University of Strasbourg, was given charge of these experiments. The following are some details from his deposition before the Military Criminal Court at Strasbourg, May 6, 1947:

In 1943, Hirt informed me that Himmler had ordered that I should undertake experiments with urotropine on men. I objected that the efficacy of the means of protection which I had discovered, was scientifically and experimentally established. I held that I should first experiment on myself, but Hirt referred this to Himmler, who forbade me to do so and gave me an order that I should proceed with the required experimentation on men.

I was assured then that the individuals who were to serve as guinea pigs had been condemned to death by a legal decision of justice. I found myself faced with a tragic problem of conscience, because Hirt had assured me that Himmler had given me this order in my capacity as an officer; that I was unable to escape from fulfilling it, even while my conscience as a doctor forbade me to undertake such experiments. I went to Berlin to consult Professor Brandt, who was the Führer's private doctor and his general delegate for all matters concerning health and hygiene. I told him about my scruples, and asked him to intervene with Himmler for me. I also declared that, scientifically, the experiments on men were not necessary as such, since the efficacy of hexamethylenetetramine had been amply proved by the many experiments I had carried out on animals. I asked him to speak to Himmler on my behalf, and to ask that he should authorise me to proceed with the experiment on myself.

At that time, the military situation was bad for the Reich. The Allies had landed in Africa, and, as I had been informed by my chiefs, the Abwehr had learned that fifty thousand tons of phosgene gas had been stored there. Gas warfare seemed inevitable. The Supreme Command of the Wehrmacht were convinced at that moment that the Allies would be obliged to resort

to gas in order to overthrow the 'Fortress of Europe.'

It was in these conditions that, during 1943 and 1944, I finally undertook the experiments with which I am now charged. I may add that, in spite of Himmler's prohibition, I had previously performed the experiment on myself in the gas chamber of Ney fort. I carried out two series of experiments, using forty subjects the first time and fourteen the second time. No deaths resulted the first time, and only one person was sick. In the course of the second series of experiments, four people died. I attribute the cause of their death to their deficient physiological condition. The subjects of this experimentation manifested symptoms of pulmonary oedema.

I realize that experiments on human beings are contrary to medical ethics. I undertook them, in spite of all and above all, because I knew in all conscience the horrors of gas warfare and that the German people were not protected against it. I therefore considered it my duty to do all in my power to ensure that protection and to safeguard the lives of countless Germans, especially women and children, should the need arise. Besides, I had received an order from Himmler; and it was constantly impressed on me that, in this field, my discovery constituted the sole means of

protection. Professor Brandt himself assured me of that.¹⁷

This deposition of Bickerbach in no way presents the characteristics of brutality, sadism and horror, which we find in the preceding depositions and statements of evidence. Human feelings make their appearance here; we are conscious of the questionings, hesitations, uneasiness of conscience, attempts at self-justification, of a man who recognizes that universally valid ethical principles do exist. Bickerbach pointed out to his chiefs, from the outset, that experimentation on human beings was not necessary from a scientific point of view; that the results obtained up to that time, by using very feeble doses of gas, were sufficient for the purpose of establishing a therapy. When the experiments were insisted upon, he requested as a preliminary that he should perform the experiments on himself, and he overrode the prohibition to do so by going down himself into the gas chamber. It was only when he had carried out the experiment on himself that he consented to perform it on others. He took steps to assure himself that the prisoners presented to him were criminals condemned to death by an authentic verdict of a Court of Justice. (This was not the case in reality—and besides, even if it were so, it would not be sufficient justification for these experiments.) He

still hesitated: should the judgment dictated to him by his conscience as a doctor, over-ride the decision of a superior whom he was bound to obey in his capacity of Officer? In the end, Bickerbach decided to undertake these experiments, with the full realization that this decision violated his conscience as a doctor: 'I realize that this is not in conformity with medical ethics;' but he considered that he was justified in doing so because he acted in the interests of the German people. (He had been assured that the Allies possessed considerable quantities of phosgene, and that this gas would inevitably be used against the German people).

VARIOUS MEDICAL EXPERIMENTS

Artificial Hormones

Dr. Ding, ¹⁸ a doctor of Buchenwald, was ordered by Himmler to give attention to the experiments of a certain Dane, Dr. Vernet. These experiments consisted in treating homosexuals with artificial hormones. 'This doctor came to Block 50 and asked Ding to supply him with prisoners. . . . Dr. Vernet selected about 15 subjects there. . . . This kind of operation under which two subjects died, was an enormous source of amusement to the S.S. doctors. . . .'¹⁹

Antigangrenous serum

When it was discovered that the use of the antigangrenous serum employed by the Army Health Service had caused many accidents when applied to the wounded, Mrugowski, 20 suspecting the phenol contained in the serum, 'ordered Dr. Ding to attend some sessions of euthanasia with phenol in a concentration camp, and to send him a detailed account of the results, because he had never seen a death caused by phenol.'

Some days later (reported Dr. Ding at the Trial of Doctors) I asked Dr. Howen of Buchenwald to advise me about the next session of euthanasia with phenol. The following evening, he called me to the hospital where I found him with another doctor, probably Dr. Blaza. The injection consisted of 20 cm³ of raw, undiluted phenol.

One by one, the four or five prisoners were introduced, the upper part

of their bodies uncovered.

They were advanced in years and poor in health. I do not remember

the reasons why euthanasia was practised, but I probably did not ask the reason. The prisoners sat quietly on a chair beside a lamp, and showed no emotion. A male nurse blocked the vein of the arm, and Dr. Hoven injected the phenol quickly.

They died during the injection, without any signs of pain and in less than a second. I remained there about ten minutes. In accordance with

the orders I had received, I made my report to Berlin.²¹

'A typically S.S. experiment,' concludes Dr. Bayle; 'criminal, of course, but also gross, without scientific basis, and without appreciable result.'

Various experiments

At Buchenwald and Auschwitz, experiments were carried out on blood transfusions and the determination of blood-groups; blood plasma and the preparation of dessicated blood; blood reactions to the administration of salicylate and of sulphanides, and to the injection of malarial blood.

These researches seem to have been ordered by the Central Hygiene Service of the S.S., where the results were gathered together for the benefit of the S.S. hospitals.

At the laboratory of Dr. Weber, the blood-group to which every new arrival belonged was established, and a small quantity of the blood of the contrary group was injected into all the subjects belonging to group A_2 , in order to establish a higher standard of agglutination. Weber was a doctor and, I believe, a doctor in the natural sciences. He was an intelligent man who fulfilled his mission at Auschwitz with all the zeal of a convinced Nazi. . . .

His researches were especially directed to the preparation of dessicated plasma. To obtain the plasma, it was necessary to have bleedings, and these were carried out by Unterscharführer Zabel, who sometimes bled 50 a day, collecting 55 cm³ from each bleeding—sufficient, in our condition of health, to entail death in a very short time. Dr. Weber was visited regularly by his chief, Mrugowski, to whom he showed what he was doing and boasted of it. . . .

In general, these experiments had no scientific basis; and I got the impression that the chief interest they held for those who performed them was that they gave Berlin the illusion of important work being done, thereby ensuring that these courageous investigators should be left in a peaceful post, far back from the front. These researches caused suffering, and very often they entailed, if not the death of the unfortunate women who endured them, at least, for many, a state of permanent invalidism.²²

Experiments with poisons

Some experiments with poison were also carried out at the concentration camp of Sachsenhausen near Oranienburg, and at that of Buchenwald. These experiments were performed by means of projectiles charged with aconitine, and with compresses of cyanide of potassium.

The alleged pretext for the aconitine experiments was the search for an antidote in case the enemy should employ bullets poisoned with aconitine. On September 12, 1944, Mrugowski addressed a report to the Criminological Institute of the Security Police, about an experiment carried out at Sachsenhausen on Russian prisoners of war with projectiles charged with nitrate of aconitine.

In the presence of Dr. Ding, Dr. Widman and the undersigned, on September 11, 1944, experiments were carried out with aconitine-charged projectiles, on five persons condemned to death. Bullets of 7 mm. 65, charged with poison in crystalline form, were used. The subject for experiment received the bullet on the left thigh while in a supine position. In two cases, the bullet passed clearly through the thigh, and no reaction of the poison could be observed as a result. . . . 23

There follows a detailed analysis of the symptoms of poisoning shown by the other three subjects, who died in two hours, after having endured atrocious suffering. Mrugowski told his audience that, although this experiment had been 'among the most horrible of his existence,' he could not cut short the sufferings of the victims, seeing that, on the one hand, there was no antidote to aconitine, and, on the other, that the purpose of the experiment consisted precisely in discovering the time necessary for the poisoning.

As to the experiments with cyanide, the German newspaper of Nuremberg, Nuremberger Nachrichten, published on February 26, 1947, a declaration by the physiology professor, Rein, to his students:

Professor Rein, Rector of the University of Göttingen, declared in the course of a public student reunion that capsules of cyanide of potassium had been made since 1943, by order of Hitler and of Himmler, with a view to the eventual suicide of the great Nazi chiefs.

It emerges from an examination of the papers found in the private archives of Himmler that experiments destined to perfect an appropriate capsule of cyanide of potassium had been carried out in a concentration camp. These experiments would have cost the lives of sixty people.²⁴

And one of the witnesses at the tribunal, Dr. Kogon, testified that he had assisted at two experiments performed on Russian prisoners of war in the Buchenwald camp:

The first time (he said) a different preparation of a series of alcaloids was put in the soup served to the prisoners of war who were lodged in Block 46. They ate it without the least suspicion. Two of the prisoners became sick and vomited; a third lost consciousness; the fourth showed no symptoms. Thereupon, all four were strangled in the crematorium. They were dissected, and an examination of the contents of their stomachs, with other investigations, was carried out.²⁵

SURGICAL EXPERIMENTS

Experiments of sulphamides on infected wounds

Experiments designed to study the efficacy of sulphamides on infected wounds were performed on prisoners in Ravensbruck between the 20th of July, 1942, and August, 1943. These experiments were carried out by Professor Gebhardt, 26 Consultant Surgeon of the S.S., and aide of many other German doctors. In the course of the first experiments—July, 1942—fifteen men were used. Then the experiments were practised on sixty young Poles, five of whom died as a result of the experiments, and six were shot after having undergone one or several ordeals. The survivors are marked with serious deformities and real infirmities. A great deal of testimony was given by those who had been prisoners at Ravensbruck: French, Czechs, Poles, and Germans. Four young Poles gave testimony in person before the Court, and showed living proofs of the experiments to which they had been subjected. A report of Professor Gebhardt, dated August 29, 1942, already indicated the course of the experiments which he had undertaken at Ravensbruck during the previous month:

From July 20, 1942, by order of the Reichsfuhrer S.S., I have performed, in the women's concentration camp at Ravensbruck, a series of clinical experiments designed to study gas gangrene, whose evolution does not always follow a fixed pattern. I was also concerned with studying, at the same time, the efficacy of the known medical therapy.

Common infections and the wounds of war surgery were also studied. We sought to study a new chemical treatment in addition to surgical measures.²⁷

Intervention on the bones, muscles, and nerves

At the same time, Dr. Stumpfegger²⁸ performed experiments at Ravensbruck on bones, muscles, and nerves. As a summary of these different interventions, Dr. Bayle gives the following details:

The bones, generally the tibias, were broken with a mallet on the operating table; they were then supported by plaster or by splints; the limb was plastered, and then the plaster was removed before the bones had set.

Numerous bone-graftings were performed, from the ablation and grafting of little fragments of the fibula and of the tibia, to the ablation and the grafting of a scapula.

Bone excisions were performed on tibias, and previously removed fragments of bone were put in the place of the excisions.

Numerous operations were performed on the muscles; the limbs of the subjects operated on, became more and more thin and emaciated.

A certain number of serious amputations were performed for experimental purposes, on mentally deficient or even insane internees.

Whole sections of nerves were also removed.

These experiments were performed on Polish, Ukrainian, Yugoslav and German internees.²⁹

Induced burns

In 1943, Grawitz sought authorization from Himmler to experiment with a pomade for burns, on concentration camp internees. Himmler agreed, and some weeks later Ding carried out experiments on the internees of Blocks 46 and 50 at Buchenwald. These subjects were cruelly burned, 30 as Kogon testified at the Nuremberg Trial:

By the agency of Koch and of the Chief of Police of Dresden, the contents of a phosphorous bomb were sent to Buchenwald. This liquid phosphorous was supplied to the forearms of four persons in Block 46, who had survived other experiments. They were treated in different ways: in one case, by water; in another, with a damp cloth; in another, with R.17. In the latter case, the drug R.17 was applied to one subject immediately after the gas had been lit; to another, five minutes afterwards, to a third, half-an-hour later. . . .

In three out of four cases, the burns were very severe. . . .

It was impossible that the majority of these wounds should heal completely. They were certain to leave deep scars, because they reached to a depth of one to two-and-a-half centimetres.³¹

Artificial phlegmons

In 1942, a biochemist attached to the S.S., Theodore Laver, with the co-operation of Grawitz, prepared experiments on the biochemical and homeopathic treatment of phlegmons. These were carried out at Dachau, where German internees and especially Polish priests were artificially infected with streptococcal pus. On the admission of Grawitz himself, some deaths occurred and the therapeutic treatment was a complete failure. According to the eye-witness, Viewg, there were seven deaths among the German internees and nineteen among the Polish priests.

EXPERIMENTS ON INFECTIOUS DISEASES

Typhus

The experimentation on typhus, which was carried out during more than two years, was what claimed the greatest number of victims: 150 to 160 deaths in the course of experiments properly so called; and 100 to 150 deaths among the so-called 'carrier' subjects, that is to say, among those who were infected in order to ensure a supply of the virus.

Towards the end of 1941, with the Russian war, the multiplication of cases of typhus among prisoners of war, but also among the German soldiers, gravely disturbed the leaders of the régime and the military chiefs. The vaccine that Germany possessed, the Weigl vaccine, was effective, but its production was 'costly, difficult, and slow.' Only the doctors and the medical personnel most exposed to infection could benefit by it. Other vaccines—that of Cox, Haagen, and Gildemeister—could be produced in great quantities; but they were not considered to have proved their effectiveness, and further experiment was considered necessary that a satisfactory result might be obtained. On December 29, a conference comprising representatives of civil medicine, of military medicine, of the laboratories and of pharmaceutical industry, decided to carry out experiments on human beings with these vaccines. These were performed in the Buchenwald camp and in that of Natzweiler-Schirmeck.

On January 5, 1942, only a week after this conference, five internees at Buchenwald received a 1 cm³ intramuscular interjection of the

Rickettsies breed emanating from the Robert Koch Institute, with a view 'to discovering the surest and most practical means of providing an artificial infection.'

It was thus that the Buchenwald Experimental Typhus Centre came into existence, directed by Dr. Ding and situated in Block 46. In the Autumn of 1943, a centre for the production of vaccine was organized in Block 50. 'The experiments consisted of infecting healthy internees of every nationality with a breed of virulent and active typhus, preserved through human transmission and usually inoculated by an intravenous injection up to a dose of 2cm3.' Seven hundred and twenty-nine internees were thus infected with virulent typhus.

Certain subjects were previously immunised with different vaccines then existing in Germany; others, belonging to a 'control group,' were infected without being vaccinated. In the therapeutic experiments, several medicaments were tried at different phases of the artificially induced typhus, but subjects belonging to a control group received no medicament.

An irrefutable document about the experiments at Buchenwald makes it possible to give an account of how they were conducted. We refer to Ding's notebook, into which he entered the principal experiments on vaccines and on antityphus medicaments performed in Buchenwald between December 29, 1941, and January 2, 1945. This notebook, preserved by Dr. Kogon, an internee for six years at Buchenwald and Ding's secretary during the last two years, was sent by him to the Nuremberg Tribunal. It begins with a short account of the Berlin Conference of December 29, 1941.38

Moreover, Kogon's testimony before the Medical Tribunal gives the following information about Ding's experiments:

When 40 to 60 persons, and sometimes 120, had been chosen for experiments, a third were set on one side, and the other two thirds were either vaccinated or treated in the manner required for the purposes of study. The subjects immunised against typhus remained in Block 46 for several weeks, until their infection by means of the agent of classic typhus, the Rickettsies; while the first third were equally infected for purposes of control, in order that the evolution of their disease might be compared with that of the vaccinated and infected subjects.

The inoculation was performed in different ways: typhus was induced cither by fresh blood, injected intravenously or intramuscularly, or, at first, by scarifications on a level with the arm. At first, 2 cm³ of fresh blood containing the typhus germ was injected intravenously; later, this dose

was reduced to one twentieth of a cm³, and even this dose was sufficient to produce serious typhus. In the course of the years, the typhus germs used at Buchenwald had been cultivated from man to man, their strength had increased, their virulence had become considerable, with the result that a very small quantity was sufficient. In 1941, I suggested to Dr. Ding to reduce to a minimum the quantity injected, in order to increase scientific control and render the artificial injection comparable with the natural injection. My suggestion was not adopted.

A third category of experimental subjects served for the conservation of the typhus germ supply. This category consisted of 'passing' subjects—three to five persons per month—who were infected only to ensure that blood containing the germs of the disease should be always available. I do not think it an exaggeration to say that 96% of these persons died....³³

Every person assigned to Block 46 awaited death—a very lingering and very frightful death, the thought of which was always before them, as well as torture and the privation of the last shred of personal liberty. It was in these psychological conditions that the subjects awaited their turn—the day, or the night, when something would be brought to them of which they knew nothing, but which they knew without a shadow of doubt to be some form of a particularly dreadful death. The injection was so concentrated that very serious typhus always developed; very often, terrible scenes occurred. The patients were always afraid that a mortal dose would be given to them.

After a certain time, when the disease had taken root, the usual symptoms of typhus made their appearance, and it is common knowledge how frightful a disease this is. . . . In some cases, the patients were delirious, and refused to eat; a high percentage died. Those who survived, because of their robust constitution and the efficacy of the vaccine, were forced to witness their fellow prisoners' battle against death. They lived in an atmosphere extremely difficult to imagine. The survivors did not know what would happen to them, if indeed they were not used for further experiments in Block 46. Or again, had they not good reason to fear for their lives, simply because they had survived and had been witnesses of these experiments? They knew nothing of all that, and this made the conditions of the experiments more intolerable for them.³⁴

Malaria

Until he reached retiring age in 1936, Professor Klaus Schilling directed the Tropical Diseases service at the Robert Koch Institute. He had devoted a great part of his labours to infections caused by protozoa, and to the discovery of a method of immunisation against malaria. The year 1941 saw him in Italy, where the Fascist authorities gave facilities for work to foreign scientists. He met Dr. Conti,

Director of the Civil Health Service of the Reich, in Rome, and the latter became very interested in his researches and asked him to return to Germany, promising to promote to the utmost his experimental work of malaria. Himmler, to whom he was presented by Conti, invited Schilling to pursue his experiments at Dachau, where he put at his disposal the camp internees to the extent of 30 per month. Schilling resided at Dachau from February, 1942, to the end of the war. He was 71 years old when he began his experiments there.

The Catholic Polish priest, Marion Dabrowska, ex-internee of Dachau, revealed to an American inquirer, on May 13, 1945, how he himself had been infected with malaria, both by means of mosquito bites and by injections of malarial blood. A total of 1,100 prisoners were thus infected, among them 200 Polish priests of whom 21 died.

The Czech doctor, Franz Blaha, who was interned in Dachau for four years and put in charge of the autopsies, made the following deposition before the Medical Tribunal of Nuremberg:

I carried out seven thousand autopsies during my period at Dachau, and I knew of many medical experiments carried out on subjects who were never volunteers. Between 1941 and 1945, about 1,200 persons were subjected to these experiments on malaria, carried out under the direction of Dr. Klaus Schilling, who had received a personal order to do so from Himmler.

When the subjects had been inoculated, various treatments were applied to them, notably quinine, neo-salvarsan, antipyrine, pyramidon, and a remedy known as Behring 2516. I carried out the autopsy on the bodies of the victims of the experiments. Thirty to forty persons died of malaria; three to four hundred later succumbed to mortal diseases due to the general weakening which resulted from the malarial attacks. Moreover, some died from poisoning, as a result of excessive doses of neo-salvarsan and of pyramidon. 35

A Luxemburg medical student, Eugene Ost, interned at Dachau and employed as secretary to the Experimental Centre, gave the following testimony:

The great majority of the subjects were inoculated, either by an injection of infected blood or by bites from infected mosquitos. The first anopheles came from Berlin; then the station provided its own supply. On April 5, 1945, the files contained about eleven hundred names of all nationalities, but principally Russians and Polish. With the exception of an assistant S.S. doctor, the employees of the station were also internees.

The dominant idea of Schilling's labours was the creation in the human

body of an immunity sufficient to render it invulnerable against plasmodium vivax, the only type used at Dachau.³⁶

Finally, here are some notes furnished by Schilling himself when he was questioned at Nuremberg:

It was not possible to refuse to execute the order given by Himmler to carry out experiments on malaria, using the internees of Dachau as subjects. I began my experiments on the prisoners there in February, 1942, and I continued them until March, 1945. I then underwent an operation, and I returned to Dachau on April 15. I remained there, because I considered that it was best both for my work and for my convalescence. On arrival at Dachau, I presented myself to the commandant of the camp, Pierkowsky, who had received orders concerning me. I obtained the prisoners necessary for my work, by furnishing a list to the chief medical officer of the camp. I estimate that I have experimented on nine hundred to a thousand subjects.

I used two methods—inoculation and mosquito bites. At first, I had seven or eight breeds, but soon I reduced them to three: a Russian breed from Ilmensee, a breed from Crete, and a breed from Madagascar. I used only plasmodium vivax which causes a mild tertian. The prisoners were chosen by the chief medical officer in the camp, and had to be healthy. They were kept under observation for some days before the inoculation.³⁷

Schilling's investigations on malaria had caused, therefore, the death of a great number of the subjects of experimentation. Of 1,200 subjects, the majority being Poles and Russians, 30 died from malaria and 400 others from its complications: tuberculosis, pneumonia, dysentery.

At the request of his advocate, Schilling, condemned to death in 1945, was granted an appeal. The American Tribunal which re-tried his case on June 23, 1946, supported the original death sentence, and Schilling was executed shortly afterwards. In summing up, the Tribunal expressed its particular severity towards the highly gifted scientist who agreed to put his knowledge entirely at the service of the Nazi régime.

* * *

Such is the picture, incomplete of course but sufficiently evocative, of the medical experiments practised by German doctors under the Nazi régime between 1940 and 1945. A great number of the experiments, aberrant for the most part, could not have occurred except in a totalitarian country where the will-to-power of the dictator and of his party had succeeded in suppressing in the doctor himself

133

all personal reflection bearing on the ethics of his profession, and -which is still more astonishing-on the conditions for a truly scientific work. In this domain, the state of war, of insecurity, of the anguish that grew with the gradual encirclement by the enemy, were not the determining causes explaining why these procedures were resorted to. Indeed, the Nazi régime had already shown itself in its true colours as early as 1935, by its measures for sterilization, euthanasia and the extermination of certain abnormal, demented, and incurable people, thereby accounting for hundreds of thousands of victims among the population. From that time, according to the expression of Professor Leibbrand,38 the 'biological idea' was substituted for the 'metaphysical idea.' Some day, perhaps, the historians will show how this process of substitution took place, and will trace the proximate and remote causes precipitating the German people into this chaos. But this passage from the 'metaphysical idea' to the 'biological idea,' this degradation of values—is it not always latent in the heart of humanity, and always in process of being realised after some fashion in some corner or other of the world? Any man at all, of whatever nationality he may be, is always exposed to the temptation of setting aside, in his own interests or in those of a group, the principles that are the safeguards of both social and individual life, in order to fashion himself or a society or the world at large according to his own ideas.

The discussions that took place in the course of the Nuremberg Trial of the Doctors, between procurators, judges, American and German doctors, on the subject of medical ethics, have indeed recalled a certain number of facts bearing on human experimentation, which show clearly that in this domain of medical experimentation the degradation of human values is always possible, even among peoples who consider themselves beyond reproach.

The German barristers attempted to establish a parallel between the Nazi experiments and those which were already being practised for fifty years in different countries and particularly in America. Even though there was only a very faint analogy between these two groups of experiments, the discussion showed that the experiments which had been carried out by certain American doctors were not always in conformal to the stable of the s

in conformity with medical ethics.

Professor Leibbrand, a witness for the prosecution, laid down as the first prerequisite for the liceity of an operation performed on the human person that the subject's consent should be entirely free; whereupon, the following dialogue ensued between Professor Leibbrand and Servatius, who was defence counsel for Karl Brandt:

Servatius.—If these prisoners (800 American internees) were infected with malaria after having declared their willingness, would you consider the experiment lawful?

Leibbrand.—No, because I do not consider their willingness and their consent to be acceptable from the point of view of medical ethics. As

prisoners, their situation was one of a compulsory nature.

Servatius.—I ask the witness to read this extract from Life for June 4, 1945: 'In three penal institutions of the United States, people imprisoned as enemies of society help to fight against other enemies of society. In the federal prison of Atlanta, in the State prison of Illinois, and in corrective establishments of New Jersey, about eight hundred prisoners have agreed to undergo infection by malaria. They receive no recompense nor any diminution of sentence. In the United States, there are a million cases of malaria every year; and it is the aim of these researches to discover a new drug capable of curing the disease, once for all.' There are four photographs. Would you please give us your opinion on the liceity of these experiments?

Leibbrand.—I cannot deviate from the basic principles of medical ethics; I consider that even experiments such as these, constitute an excess of the current fashion of biological thought, and I agree with the jurist Ebermeyer who, in his book The Doctor and the Law, points out that it is impossible to foretell the consequences of an experiment. As a psychiatrist conversant with malariatherapy, I must add that malaria is a very serious disease, whose complications may be septic thrombosis and an excitation of the cardiac muscle capable of causing death. Malaria is a long-term disease, which can be fatal; and that is why these experiments should be carried out on guinea pigs, not on human beings. 39

Sauter, defence counsel for Ruff, posed the following question to Dr. Ivy, American expert for the prosecution:

Sauter.—Why are condemned men used as subjects for experimentation,

in America and elsewhere? Why do you not use free persons?

Ivy.—Partly for the same reason that we use conscientious objectors: objectors have nothing else to do except to be of service. Prisoners in an penitentiary can give all their time to experiments, and can be submitted to strict control. A doctor or a medical student has other things to do, and if either was a little sick, he could not efficiently perform his daily work; while a prisoner has nothing else to do, and can become sick without serious consequences. 40

It must be admitted that this is a poor explanation! This principle of efficiency, of social service, to which Dr. Ivy appeals, is scarcely valid when it involves an attack on what we can regard as the essential liberty of man.

And later, in the course of the same discussion, Sauter seems to

have embarrassed the American expert to some extent:

Sauter.—Strong declares in his report that he used nine hundred prisoners condemned to death, all volunteers. We find it a strain on our credulity to imagine how it was possible to have nine hundred persons condemned to death, who were also volunteers, in such a small town as Manila. In the Philippines and in America, there are unemployed people who would be only too glad to earn a little; and you have said that certain people received a hundred dollars recompense, and probably their keep and free cigarettes. Why have you used conscientious objectors, the condemned, and even those condemned by the Federal Court, and not the unemployed?

Ivy.—To my knowledge, there were no unemployed in America during

the war.

Sauter.—From the point of view of medical ethics, do you consider that it is a violation of medical ethics to carry out, in America or in any other civilized nation, experiments entailing a certain degree of danger, on prisoners who have been previously made to sign a paper waiving all claims to eventual compensation, even for their heirs:41

Servatius pressed his point:

Servatius.—Eight hundred prisoners or more have submitted voluntarily to these experiments on malaria. What reasons can you offer why a prisoner should volunteer?

Ivy.—These prisoners volunteered in order to help those menaced by malaria.

Servatius.—In the broadcast account it transpired that one had sons in the Army, another had brothers, and a third volunteered for patriotic reasons. Am I right in supposing that all these men gave very idealistic reasons for their decision?

Ivy.—That is so, and I have been assured of that by persons who have observed these experiments. . . . A prisoner in a penitentiary has no reason for not loving his country. . . .

Servatius.—If all these subjects volunteered for idealistic reasons, why

were they offered financial reward?

Ivy.—To compensate, I suppose, for the disagreeable nature of the experiments. . . .

Servatius.—Why was the money not paid immediately, but in two lots: fifty dollars at the beginning, and fifty at the end of the operation? Ivy.—I suppose that such is the mode of business procedure in the United

States, and that the jurists have food for thought regarding it.

Servatius.—Is it not because the prisoners might lose their enthusiasm and cease to co-operate, that this precaution of payment was adopted? Ivy.—I doubt it.

Servatius.—Yesterday, we were shown a document of the prosecution

from the department of Justice of Texas prison. It is a declaration of voluntary consent, and runs thus: 'I agree to co-operate fully with the doctors who are to direct this investigation during an observation period of about eighteen months. I understand that at the end of that period, I shall be given an appropriate certificate of merit. The declaration of my voluntary co-operation and the fact that I have thus voluntarily rendered a signal service to humanity, will be recorded in my dossier. . . . Would not this somewhat considerable promise be sufficient to induce a prisoner to volunteer without having any idealistic motive? This certificate is of a very practical kind, and may help the prisoner when he seeks employment after his release. 42

Moreover, all agree in affirming that experimentation on human beings demands that the subject should be very clearly informed of the conditions and consequences of the experiment, and that the doctor should assure himself

that the explanation he gives is understood perfectly. 43

In connection with the experiment on beriberi, carried out in Manila by Strong, Dr. Rose put the following question to Ivy:

Rose.—. . . The account of the disease informs us that the twenty-nine subjects of the experiments could speak neither English nor Spanish nor even the native dialect of Manila, and that it was possible to converse with them only through interpreters who used their native dialect. It appears that they were completely illiterate. Do you consider that subjects of this kind are capable of grasping the significance of an experiment on beriberi?

Ivy.—I think so, since beriberi is endemic in the region they come from.

Rose.—You know as well as I do, that beriberi does not exist in the

mountainous region of the Philippines. 44

* * *

We would clearly and emphatically insist that our intention, in assembling these few notes, is not to question those medical experiments on man, which, in the conditions in which they were practised and in the ends which they pursued, have nothing or almost nothing in

common with criminal experimentation.

By recalling, however, certain facts underlined by the German counsels for the defence, we wished to point out that, in this problem of experimentation on man, the doctor may be easily tempted to exceed the limits of liceity, and thus violate the essential rights of the human person. 'One of the demands that morality makes on the doctor is that he should know how to control his natural desire for research.' (Moll). 45 This does not mean that the duty of research is not incumbent on the doctor; it has the same title to his consideration as his duty to

respect the individual confided to him for a therapeutic purpose. The last paragraph of a circular from the German Ministry of the Interior dated February 28, 1931, says very justly:

The doctor should have a profound feeling of his responsibility towards his patients and towards all whom he treats. But at the same time, the doctor must be conscious of his responsibility to seek out new methods, when the methods at his disposal prove insufficient.

GONZAGUE PIERRE.

NOTES

This trial was carried out by an American Military Tribunal whose competence

and powers had been determined by Law No. 10 of the Control Council.

² Abundant documentation on this Nuremberg Trial of the Doctors is available, thanks to two works, one in French, the other in German. The first is by Dr. Bayle: Croix Gammée contre Caducée, Les Experiences humaines en Allemagne pendant la 2e guerre mondiale. (1,521 pages in 40. Depôt central: Imprimerie Nationale, Service de vente des Publications officielles, 27 rue de la Convention, Paris 15e). On October 19, 1946, Dr. Bayle was nominated to the French Scientific Commission on War Crimes. After having enquired in the three zones of occupation concerning the medical experiments on human beings performed in Germany, Dr. Bayle was accredited to the American Authorities of Nuremberg, and followed the course of the different trials of war criminals. He gave us a detailed study on each of the arraigned doctors; a very great number of documents on the major Medical Services of the Third Reich; reports of experiments furnished to the Himmler Services by the various doctors; and a considerable part of the interrogations, evidence, and depositions of the trial.

The second work is that of two German doctors, Privatdozent A. Mitscherlich and Fred Mielke, entitled: Science without Humanity: Medical and Eugenic Heresies during the Dictatorship, the Bureaucracy and the War. (Lambert Schneider, 1949). It covers the same Nuremberg trial, and was undertaken under the auspices of the

Western German Medical Corporation.

In the course of this article, we refer to these two works with the simple indication:

Bayle, Mitscherlich.

After Himmler, the persons principally responsible for these experiments were: Dr. Ruff, Head of the Medical Section of the experimental Aeronautical Centre in Berlin; his assistant, Dr. Romberg; and especially, Dr. Rascher of the S.S. The latter was an adventurer, probably a pervert, who disappeared towards the end of the war. It is thought that Himmler, fearing his garrulity, may have interned him in Dachau, where he may have been shot before the arrival of the American troops.

Bayle, pp. 323-24; Mitscherlich, pp. 11 and 12.

Bayle, p. 443; Mitscherlich, p. 36. Bayle, p. 370; Mitscherlich, p. 23.

Bayle, p. 447.

Dr. Holzlohner committed suicide after having been questioned by an English intelligence officer.

Mitscherlich, p. 44.

This report figures in extenso in the work by Dr. Bayle, pp. 461-90, and large

extracts are contained in Mitscherlich, pp. 44-48.

11 The Ahnenerbe Society was an S.S. Research Institute, founded on July 1, 1935, for the study of problems dealing with the Nordic race. From January, 1942, a Military Institute of Scientific Research was added to this society; and from that date, the Ahnenerbe was attached to Himmler's General Staff.

12 A professor of the Strasbourg Faculty from 1941, Hirt caused 87 Jews in the Natzweiler camp to be put to death in order to form a collection of skeletons. He disappeared at the approach of the Allies, thereby making sure that the enemy would

not find him alive.

13 Bayle, p. 877; Mitscherlich, p. 158.

14 A doctor who for more than ten years belonged to Himmler's personal medical

Bayle, p. 886; Mitscherlich, p. 157.

16 Holl's answers to Procurator J. MacHaney: Bayle, pp. 888-90; Mitscherlich,

Bayle, pp. 907-9; Mitscherlich, pp. 162-64.

18 Director of the Research Centre for typhus and virus attached to the Hygiene Intsitute of the Waffen S.S. at Buchenwald.

- Deposition made before the Tribunal by Eugen Kogon, six years an internee at Buchenwald where he served as secretary to Dr. Ding. Bayle, p. 984.

 Chief of the S.S. Hygiene Service.
- 21 Bayle, p. 987.
- 22 Ibid., p. 991.
- 28 Ibid., p. 996.
- 24 Ibid., p. 1,003.
- ²⁵ Ibid., p. 1,004.
- 26 Condemned to death by the Nuremberg Tribunal.
- ²⁷ Bayle, p. 1,008; Mitscherlich, p. 126.
- Doctor and friend of Himmler. Specialist in bone grafting. Stumpfegger later became doctor to Hitler's bodyguard.
- 29 Bayle, p. 1,009; Mitscherlich, pp. 145 ff.
- 30 The cruel and probably useless character of these experiments shock us very much, given that here they appear in conjunction with a concern for scientific research. One recoils from this horror of seeing a man transformed into a guinea pig. Nevertheless, in remembering this blatant cruelty, one cannot help recalling other cruelties, analogous in their chemical effects, which do not always arouse the same horrified reaction. We are thinking especially of the tons of phosphorous which the Allies dropped, at that same epoch, on the civil population of Germany. But this is a moral problem of a completely different order which calls for separate treatment.

 31 Bayle, pp. 1,117—18; Mitscherlich, p. 151.
- This journal is completely reproduced in the work by Dr. Bayle: pp. 1,134—46; Mitscherlich, pp. 83 ff.
- Here we reach rock bottom in the process of man's degradation. Here, indeed, it is no longer simply a matter of experimentation, but of the preservation on man of a virulent breed of germ carriers to serve for other current experiences. Man is no longer the human guinea pig; he is the human soil for the growing of a virus.

 Bayle, pp. 1,113—74; Mitscherlich, pp. 84 and 89. In the *Presse Médicale* for May 18, 1946, a description of experimental typhus at Buchenwald, written by Drs.
- Waitz and Ciepielowski, can also be found.
- 35 Bayle, p. 1,357.
- 36 Ibid., p. 1,358.37 Ibid., p. 1,370.
- ³⁸ Professor of Medical History at the Erlanger Faculty. Witness for the prosecution at the Trial of the Doctors.
- ³⁹ Bayle, p. 1,423; Mitscherlich, opp. 199 and 244.
- 40 Bayle, pp. 1,448 and 1,449; Mitscherlich, pp. 27 and 34.
- ⁴¹ Bayle, p. 1,449; Mitscherlich, p. 263. ⁴² Bayle, pp. 1,449, 1,450 and 1,451.
- This is clearly one of the most delicate points to clear up. To what extent, indeed, at least in the majority of cases, is the patient capable of perfectly understanding the conditions and the consequences of an experiment, so that his consent or refusal is perfectly motivated, that is to say, really free? It is the investigator conducting the experiment, who alone is capable of appreciating the favourable or unfavourable chances, the margin of risks, involved in the experiment he undertakes. Again, is it such an easy matter for him to convey to the patient, in a perfectly objective way, what it is that, in his opinion, justifies this experiment?
- Granted that there is a human equality between doctor and patient, it would be absurd to conclude that there is also a technical equality. As Professor Savatier says: 'It is essential to the appreciation of the problem, that the doctor should know how to convey it to the patient in a language the patient can understand, in order that the latter may be brought face to face with his own responsibility.'
- In short, both as regards experimentation and therapy, the basis of the patient's confidence should be sought in the skill and in the conscience of the doctor.
- 44 Bayle, p. 1,460; Mitscherlich, p. 99.
- In 1922 Professor Moll published in Germany an important work on human experiments performed by doctors in the course of the nineteenth century. 'Albert

Moll censured the constant growth, since 1905, of human experimentation in all parts of the world. He referred to more than 600 works in which more than 1,000 experiments on human beings were described. Interest was being shifted from the human individual to an anonymous humanity which these experiments were supposed to serve. The doctor regarded himself above all as a naturalist, and was becoming blind to what we call today the existential values. Man was becoming a bundle of reactions.' (Documents, April, 1949, p. 394).

German Criticisms of the Accusations Against German Doctors

WE GIVE HERE some passages from the conclusion of the German work by Mitscherlich and Mielke on the Nuremberg Trials. We regard these reflections as of interest in view of the documentation which precedes. They show what can be gained from a knowledge of these experiments, which are indeed somewhat abnormal, but which, in spite of this particular character of abnormality, nevertheless belong to the normal course of history. As such, it is worthwhile considering them with a view to deriving useful lessons for the habitual exercise of Medicine. This is especially important to the present time, when necessary adaptations of Medicine to economic and social transformations require, both in the medical body and in the State, a very precise idea of the original and immutable relations which

exist between doctor and patient.

The gross error that must be avoided is to regard those condemned by the Nuremberg Courts, and those who were in relation with them, either personally or by reason of their functions, as abnormal, inhuman, or as social individuals. The only doctors named in the course of this trial who deserve to be so stigmatised, are Rascher, Hirt, Clauberg and Hoven. Apart from these rare exceptions, it is extremely significant, on the contrary, that the lives of the condemned and of nearly all those immediately or remotely connected with their work, share a common characteristic. Until the war and the dictatorship created the situations we know of, these men were irreproachable citizens, happy in their researches or in their professional medical activity. The fact that they did not resist the suggestions made to them can be ascribed to human weakness; but it may be ascribed equally to the character of their ideas and to the habits they had derived from their scientific education itself. When one seeks the reasons for this acquiescence in the demands of a government whose ideology was so opposed to all the duties of the medical body, an important reason immediately suggests itself: the fact that the same person was at once doctor, research scientist, and soldier. Obedience to military duties led to the abuse of Medicine and contempt for duties to humanity. A military chief of staff took seriously the cause for which the soldier was fighting; but this meant that, in this ideological war, it was necessary that he should take seriously the ideology itself. (This was very specially the case in the

S.S., whose particular situation could alone make possible the experiments reported). The consequence of this for the doctor-soldier was a displacement of the values that determined his actions. This implies that, supposing that these events are unthinkable outside the sphere of a Medicine based on scientific naturalism—that is, a Medicine which excludes the individual—they would never have been realised if these doctors had not allowed themselves to be drawn outside the domain of their proper activity. They were obedient in the sense that they took their military duty more seriously than their proper duty of bringing succour to any and every man in any and every circumstance. . . .

The trials have certainly brought to light how appeals were made to authority, and how, even in the highest instances, attempts were made to shelter behind the excuse of orders received. . . This shows that, in the medical profession, responsibility is of value only if it is indivisible, and that this condition of indivisibility is necessary to preserve it from all abuse and from all error. . . .

In the course of these trials, allusion was made to questionable experimentation on human beings carried out in other countries, and in some cases even before the Nazi régime. This question now plays an important part in the discussions to which these trials have given rise, and deserves careful attention, not in order to excuse these actions of German doctors, but because the discussion of the problem of human experimentation and the growing lack of knowledge with which it is being discussed, throws light on the extremes to which a certain mode of thought peculiar to scientific research can go, when it is applied to the science of Medicine. . . .

These trials have clearly shown that the 'indifference' of researchers to political issues is the policy of the ostrich. This ostrich policy, so far from preventing the infiltration into science of ideological postulates such as those dubious theses on socialism or nationalism during the Nazi régime, simply favours such infiltration. This infiltration begins to modify profoundly the conception a great professional body has of its profession. Thus, those who had lost their liberty through a first, perhaps very hesitant, collaboration, were gradually compelled, by threats that became less and less veiled, to bow to a power that had no scruples about the traditions of medical ethics. The wording of a few orders allows us to follow more closely this increasing grip of the State idea on the personal sphere of relations between doctor and patient: determination of capacity for work; aptitude for military service in time of war; mass sterilization; mass euthanasia in the interests of large scale eugenics. . . . ¹ They were introduced into medicine through political machinery established by a revolution that accepted the most outlandish biological fictions as current coinage of the ideological realm. . . .

It does not seem impossible that this very recent history may repeat itself in some fashion, or even that it is not already repeating itself in some part of the world. That is why we think it necessary to recall ceaselessly this lesson from the past.

The most important political and social problem that arises from these trials is that of the position of medicine as a liberal profession. None of the condemned, none of those implicated in any way in those criminal actions, took this liberty seriously. We are not speaking solely of liberty as understood in an individualist or liberal period, but of the liberty that emerges from the particular position of the doctor in society. Karl Brandt once spoke of a 'superior interest of the State' to which the doctor must yield. Thus a tragic confusion results: the relations between the doctor and societythat is to say, between the doctor and the mass of men who come to him with their distress and their miseries—is subordinated to obedience towards a mythical state. Through this obedience the doctor breaks the links of a vital relationship in order to submit himself to the demands of a 'rational planification' such as it appears in the course of historical evolution. Professor Gebhart, one of the major accused, rightly insisted that the dispensation from the medical secret given by Hitler with regard to important State personages, has a well-known precedent in the fact that the social insurance doctor must communicate his diagnosis to competent civil servants.2 The confidence that should be the basis of the relations between the doctor and his patient is therefore endangered in many cases for extramedical reasons. It is in vain today that the governmental eugenic programme, which was simply a brutal programme of extermination, has been suppressed; the doctor must still fight unceasingly for the liberty of his profession, a liberty on which the exercise of his most elementary duties depends. It is indeed of no concern to the future, whether a 'Diktat' that scorns the individual originates in an indifferent bureaucracy or in an aggressive ideology.

It must not be forgotten that the actions which were the matter of the Nuremberg Trials provide an additional proof that these modifications in the relationship between the doctor and the State are introduced gradually, slowly, and always for good motives. Step by step, through successive compromises, the individual's liberty of action is curtailed, until the day comes when he finds himself faced with one of those conflicts which he has provoked by his concessions, and from which he cannot extricate himself without guilt. The institution of assurance funds is an example of such an evolution. It is interesting to note that when the Nuremberg verdicts were being reached, similar solutions—for example, a complete socialisation of the medical profession—were being demanded by public opinion, and even carried out, in certain countries.

The tendency to socialisation, which awakens a new sense of responsibility in the economic field, finds here a limit to its otherwise very fruitful realisations. The relation between a doctor and his patient remains, indeed, a fundamental and immutable relation between individuals. While social structures change in the course of history, this relation belongs to those human encounters whose type is eternal, as for example, the relation of lover to beloved and of master to pupil.

Bureaucratic pressure is also brought to bear on the doctor's conscience

by material threats. The published documents have given a very comprehensive picture of the destructive effect of the bureaucratic forces of institutions that have no appreciation of the particular position of the doctor in society. The doctor-patient relation is in great danger of being replaced by an 'organised' social and impersonal relation.

Thus, over and above the individual cases and the persons implicated in these cases, a fundamental conclusion can be drawn from the Nuremberg trials. A common effort by all doctors is necessary in order to preserve, in the circumstances of today, a liberty for which they alone must answer. These efforts will succeed only if the doctors do their utmost, through their professional associations, to preserve that human style of thought and mode of action which will always be the characteristic of authentic Medicine, and which is the best safeguard against the misunderstanding that so many of our contemporaries bring to the eternal duties of Medicine.

Regression to the stage of termites, which destroys all really human existence with the liberties attending such existence, can be halted only by the action of real elementary relationships. The community created in the relation between the doctor and the patient is one of the oldest of such communities, and it ought to be renewed daily. If the consideration of these trials awakens in doctors a new consciousness of what they are, not only will the victims of the crimes stigmatised here be honoured in a concrete way, but a proof will be furnished that the lessons of history can be taken

seriously. (Mitscherlich, pp. 229-307.)

NOTES

¹ These few examples refer to very different domains. There is no question of denying —as the rest of this article shows—the necessity of an adaptation of Medicine to new economic and social structures. N.D.L.R.

This dispensation from the medical secret vis-a-vis State functionaries, is peculiar

to Germany. N.D.L.R.







